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CLINICAL PORPHYRINURIA

WITH REPORT OF A CASE OF THE ACUTE IDIOPATHIC TYPE

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Porphyrinuria of such a degree that the abnormal colour leads to examination of the urine is rare (see below). Study of cases, however, may be of considerable importance in furthering our knowledge of the building up of haemoglobin and of the metabolism of pigments in the human body. Similar studies are clearly indicated in lesser grades of porphyrinuria which are not suspected from the colour of the urine but which require for their recognition quantitative determinations of, or special qualitative tests for, the porphyrins. Indeed, the separation of "clinical" or "frank" porphyrinuria from the lesser grades is obviously arbitrary, but has clinical value in two respects: first, the urinary colour itself calls for special investigation; and, secondly, it seldom happens that the porphyrinuria is clinically of paramount importance unless the urine is abnormal in colour. For these reasons discussion is here limited to clinical porphyrinuria.

Probably relatively few physicians in this country are familiar with the brilliant work of Hans Fischer and his colleagues on the chemistry of the porphyrins. Since studies of porphyrinurics and all hypotheses of the causes of porphyrinuria must be subject to this knowledge, it is essential to give at least a brief summary of it. Owing to the almost complete absence of a reasonable account of acute idiopathic porphyrinuria from British textbooks, our clinical experience of the case reported below should be of value.

Nomenclature and Summary of Chemistry of Porphyrins

Haemoglobin belongs to the group of chromoproteins and consists of globin united with a complex pigment, haematin. Haematin is an iron derivative of porphyrin. The porphyrins themselves contain no iron and are not proteins. Haemin is the hydrochloride of haematin. It has been known for many years that when iron is removed from haemin by the action of acids a porphyrin is formed, called "haematoporphyrin" by Nencki, its discoverer. It was for long assumed that the porphyrins in urine were the same, hence the employment of the term "haematoporphyrinuria," which is even now sometimes seen in clinical literature. Later it was shown that only by the use of mild reagents such as acetic acid and hydrazine upon blood or haemin is it possible to separate the corresponding porphyrin without alteration. This natural porphyrin is designated "protoporphyrin" ($C_{34}H_{34}N_4O_4$). Haematoporphyrin ($C_{34}H_{38}N_4O_6$), which results when a drastic reagent such as concentrated sulphuric acid is used, is a chemical artefact and not a naturally occurring substance. Hans Fischer showed that the main porphyrin in the urine in congenital porphyrinuria was different from protoporphyrin, and called it "uroporphyrin." The chief porphyrin in the faeces in the same disease was different again, and Fischer called it "coproporphyrin" (*syn.*, stercoporphyrin).

It has long been known that even in health the urine contains minute traces of a porphyrin. By working up enormous volumes this has been isolated and shown to be coproporphyrin. Nowadays, therefore, the term "porphyrinuria" is employed to denote an excretion of urinary porphyrin in excess of the normal amounts, and the porphyrins present may be coproporphyrin or uroporphyrin, or both. Similarly, the faeces may contain a mixture of porphyrins, but in this excrement the list is extended; in addition to coproporphyrin and uroporphyrin there may be protoporphyrin (by degradation of haemoglobin ingested or from haemorrhage into the gut), deuteroporphyrin (by degradation of haemoglobin or myohaemoglobin), and others.

Hans Fischer has synthesized haemin, which is easily prepared from blood in crystalline form (Teichmann's crystals), and has shown that it is $C_{34}H_{32}N_4O_4FeCl$, with the following structural formula:

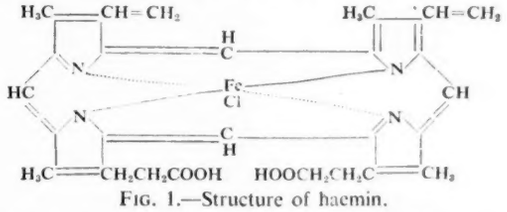

FIG. 1.—Structure of haemin.

Fischer and his colleagues have established the formulae of many of the porphyrins, some of which are given in

the table below. The parent substance of them all is porphin, $C_{20}H_{14}N_4$ or $C_{20}H_6N_4.H_8$, with the following structure:

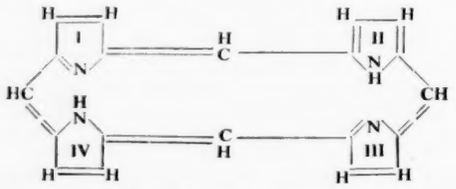

FIG. 2.—Structure of porphin.

The different porphyrins are obtained by substitution of different groups (methyl, ethyl, vinyl, acetic, propionic) for the hydrogens in the β, β' position in the four pyrrole rings of porphin. The corresponding haemins are obtained by attachment of Fe···Cl to the nitrogens of the four pyrrole rings (see formula of protohaemin above). In the corresponding haematins (oxyhaematins) Fe···OH, and in the reduced haematins Fe· (ferrous), is in the same position.

The following table summarizes the formulae of the substances which have been or are about to be mentioned:

Substance	Ring-structure	Side-chain Groups
Porphin	$C_{20}H_6N_4$	8H
Aetioporphyrin ..	$C_{20}H_6N_4$	4(CH_3) and 4(C_2H_5)
Protoporphyrin ..	$C_{20}H_6N_4$	4(CH_3); 2(CH_2CH_2COOH) and 2(CH:CH_2)
Haemin (protohaemin)	$C_{20}H_4FeClN_4$	4(CH_3); 2(CH_2CH_2COOH) and 2(CH:CH_2)
Coproporphyrin ..	$C_{20}H_6N_4$	4(CH_3) and 4(CH_2CH_2COOH)
Uroporphyrin ..	$C_{20}H_6N_4$	4(CH_2COOH) and 4(CH_2CH_2COOH)
Deuteroporphyrin ..	$C_{20}H_6N_4$	4(CH_3), 2(CH_2CH_2COOH) and 2H
Bilirubin	Porphin ring opened	

This is complicated, but becomes more so when the fact is considered that numerous isomers of these compounds are possible, depending upon the order of arrangement of the substituent groups upon the pyrrole rings; Fischer *et al.* have synthesized many of these. There are fifteen possible isomers of protoporphyrin, but by suitable treatment a simpler porphyrin—aetioporphyrin—is obtained, of which there are only four possible isomers, designated, for convenience, aetioporphyrins I, II, III, and IV.

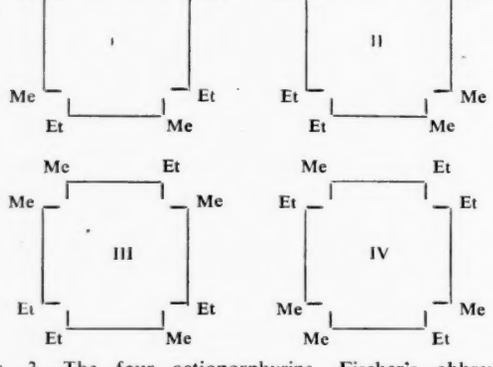

FIG. 3.—The four aetioporphyrins. Fischer's abbreviated formulae, showing positions of substituents in β, β' positions in pyrrole rings.

These may be regarded as the starting-point of four series of derived pigments, I, II, III, and IV. So far, in Nature porphyrins of the I and III series alone have been encountered, and the difference between these will be seen to lie only in the exchange of positions of two neighbouring groups in one of the rings. The structures of the naturally occurring coproporphyrins and uroporphyrins are reproduced in Figs. 4 to 7.

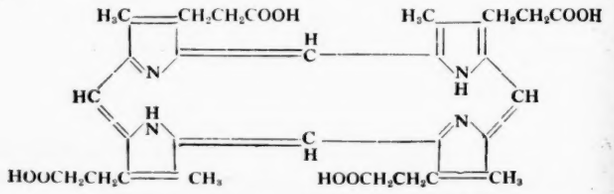

FIG. 4.—Coproporphyrin I: $C_{36}H_{38}N_4O_8$

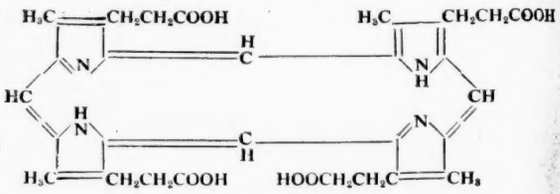

FIG. 5.—Coproporphyrin III.

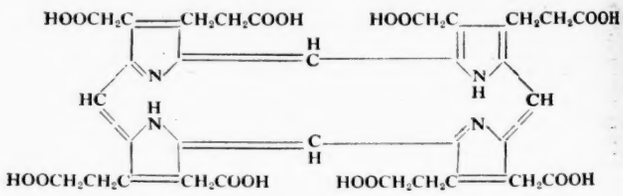

FIG. 6.—Uroporphyrin I: $C_{40}H_{38}N_4O_{16}$

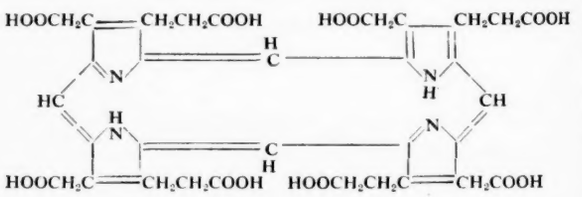

FIG. 7.—Uroporphyrin III.

Fischer *et al.* showed that haemoglobin and chlorophyll belong to series III, whereas the porphyrins in the excreta in disease belong mainly to series I. This is important, because it excludes the possibility of the porphyrins excreted in disease being derived by breakdown from haemoglobin. Passage from series III to series I would necessitate breakdown into the constituent pyrrole units and rebuilding into the new configuration—a sufficiently unlikely occurrence.

In addition to deciding whether the porphyrins in urine are coproporphyrin or uroporphyrin, or both, it is now necessary to show whether they belong to series I or III, or both, if data are to be obtained on which sound hypotheses can be built as to their origin.

In the methods employed in this work advantage is taken, as usual, of differences in solubility, crystalline form, melting-point, mixed melting-point, spectroscopic properties, etc. Since the free porphyrins do not possess sharp melting-points, they are converted into their crystalline methyl esters, which have well-defined melting-points for identification. So far as possible the investigations are carried out quantitatively; but they are laborious, and require considerable experience owing to the small amounts of the porphyrins and the complexity of biological fluids and tissues.

The melting-points of the methyl esters are: coproporphyrin I, 252° C.; coproporphyrin III, 145° C. (remelt 172° C.); uroporphyrin I, 302° C.; uroporphyrin III, 261° C.

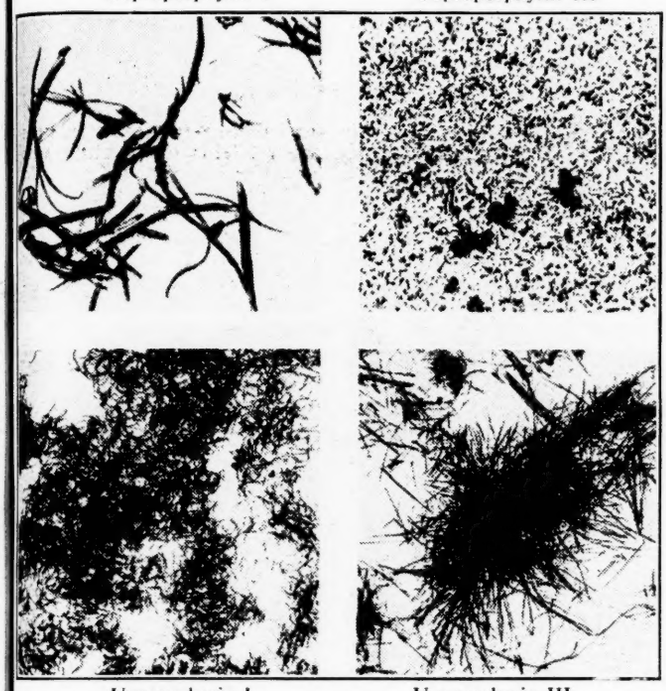

FIG. 8.—Crystalline porphyrin esters. The uroporphyrin I ester was from bones (Rimington (1936), Fig. 13), the other three esters from the urine of our case of acute idiopathic porphyrinuria.

Wave-lengths (mμ) of Absorption Bands of Porphyrins

Acid Spectra (25 per cent. HCl):

Proto-	602	557
Copro-	594	551
Uro-	597	554

Alkaline Spectra (N/10 alkali):

Proto-	645	591	540	?			
Copro-	618	569	539	504			
Uro-	612	561	539	504			

Neutral Spectra (in ether):

Proto-	633	585	576	537	502			
Copro-	624	597	578	568	529	498		
Uro-	Insoluble in ether.							

Classification, Frequency, and Literature of Clinical Porphyrinuria

Adhering to the definition already given, there are three types of clinical porphyrinuria: (1) congenital (less than thirty cases published); (2) due to drugs, such as sulphonal, trional, etc. (about 100 cases published); (3) acute idiopathic, of unknown cause—about fifty cases recorded in the older literature; recently .103 from Sweden by Waldenström (1937). Several schemes of classification have been proposed, but need not be considered in detail here. Waldenström (1937) has recently made the suggestion that the term "porphyry" should be reserved to embrace conditions 1 and 3, in which the constitutional element predominates, while all other types of increased porphyrin excretion should be grouped under the heading "porphyrinuria."

The literature dealing with porphyrins and porphyrinuria is enormous, and in this brief summary only a few reviews and long articles can be mentioned, from which, however, the reader will have no difficulty in obtaining an introduction to it. Congenital porphyrinuria is dealt with by the late Sir Archibald Garrod (1923) in his *Inborn Errors of Metabolism*. Reference should also be made to Mackey and Garrod (1922, 1926) and to Garred (1936). For the German work on the case of Petry, see Fischer, Hilmer, Lindner, and Pützer (1925) and Borst and Königsdörffer (1929). For congenital porphyrinuria in cattle, see Fourie (1936), Rimington (1936), and Fourie and Rimington (1938). Porphyrinuria due to drugs is reviewed by Günther (1922). Papers by Garrod and Hopkins (1894–6) and Drigalski (1937) contain interesting points. Increased porphyrin excretion in pellagra has been dealt with by Beckh, Ellinger, and Spies (1937). Acute idiopathic porphyrinuria is reviewed by Günther (1922). See also Mason, Courville, and Ziskind (1933), Waldenström (1934, 1939), Mertens (1937), Turner (1938), and Geissler (1939). For general reviews consult Fischer and Zerweck (1924), Fischer (1930), Carrié (1936), Vannotti (1937), Waldenström (1937), Hernando (1938), and Watson (1938).

Chief Signs and Symptoms of Clinical Porphyrinuria

Only the salient features are summarized in the following table. Further details concerning the acute idiopathic form are given below.

Type of Porphyrinuria	Congenital	Due to Drugs	Acute Idiopathic
Red urine	From birth	After much drug	Usually in adult life
Photosensitivity ..	Severe	Absent	Absent or very mild
Pigmentation of bones and teeth	Present	Absent	Absent
History of drugs ..	No	Yes	No
Abdominal and other toxic symptoms	None	Present	Present
Sex incidence.. ..	Mostly males	Usually females	Mostly females

A Case of Acute Idiopathic Porphyrinuria

The patient was a male insurance clerk aged 28, and was referred to St. Bartholomew's Hospital by Dr. K. R. Bali on September 19, 1938. He was under the care of one of us, complaining of severe abdominal pain, constipation, vomiting, loss of weight, occasional frontal headache, and insomnia.

HISTORY OF PATIENT

He had had measles and scarlet fever in childhood. In 1929 or 1930 he had pain over the whole abdomen, in occasional attacks, usually coming on ten to thirty minutes after a meal and frequently relieved by an alkaline powder. These attacks, each lasting about a fortnight, were separated by intervals of three or four weeks and became slowly more severe, until in 1937 he started to vomit. In 1937 his appendix was removed at Old Church Hospital, Romford; it was said to be chronically inflamed. Following this he had pneumonia and a left-sided pleural effusion. He left Romford much improved, but was admitted to St. Bartholomew's Hospital because the pleural effusion persisted. A skiagram of the chest revealed some dense calcareous foci in the right upper lobe, and the erythrocyte sedimentation rate was 49 mm. in the first hour. He was sent to Ventnor Sanatorium for six months, at the end of which period he was free from symptoms. There was never any specific evidence of tuberculosis, and never any haematemesis or melaena.

The patient believed it was in 1935 that he first noticed that his urine would sometimes darken on standing; darkening of the urine was not observed at Ventnor. In March, 1938, he had a bad attack of abdominal pain and vomiting, and his urine was red. There was no history of drug-taking, apart from the alkalis mentioned above, and six Dr. Cassell's tablets just before his final admission on September 19, 1938. His father suffered from disease of the kidneys, and passed urine the colour of blood. Two sisters and three brothers are living, but there is no history of any of them passing abnormally coloured urine. One sister died from pulmonary tuberculosis. There is no consanguinity between the parents.

The final attack started two weeks before his admission to St. Bartholomew's Hospital. He had been unable to keep anything down, and had no desire for food. He had lost a stone in weight in three weeks. On examination he was thin and sallow-looking. His whole body was a little brown, and

this was most noticeable on his face, on which a few pigmented spots were present, but no scars. There was no patchy bronzing and no hypertrichosis. On the front of both knees there were six or seven round scars 1/4 to 1/2 inch in diameter, believed to be due to falls as a boy, but there were none on the elbows; he had a few septic spots on the trunk, each about 3 mm. in diameter. There was no definite evidence of photosensitivity. The eyes were normal, the tongue was furred, the teeth sound and not stained, and the mucous membranes were normal in colour. The temperature was occasionally 99°, but generally normal; the pulse was about 100, and the respiration rate normal.

EXAMINATION

Nothing abnormal was detected in the heart, and the blood pressure was 120/96. There were no physical signs in the chest, but a skiagram again showed the calcareous foci mentioned above; tubercle bacilli were not found in the sputum, which yielded a mixed growth of organisms in which pneumococci predominated. The erythrocyte sedimentation rate was 5 mm. in the first hour (September 21), and the Wassermann and sigma reactions were negative. There was generalized tenderness over the abdomen, but no mass was felt at first, and the liver and spleen were not enlarged. A barium meal on September 22 revealed nothing abnormal, and another on September 28 showed that though evacuation took a considerable time there was no evidence of obstruction. Tests for occult blood in the faeces were negative. Apart from brisk reflexes, nothing unusual was found in the nervous system.

The urine was normal in colour immediately after it was passed, but rapidly darkened, becoming deep brown or reddish brown in a few hours. Thus a sample received in the laboratory on September 21 was of a deep port-wine colour and acid in reaction; spectroscopically there were two absorption bands in the green very much like those of oxyhaemoglobin, and a band at the junction of the green and blue. Microscopically there were no red cells. Chemically there was a minute trace of protein, but the pyramidon test for blood was negative; Schlesinger's test for urobilin was strongly positive. By means of the tests given later it was shown without any doubt that the oxyhaemoglobin-like spectrum was due to a metallo-porphyrin. Subsequently many samples of urine were examined by two of us, and all showed the same behaviour, though of course the concentration of metallo-porphyrin and of urobilin varied. The effect of heat was as described under "Urinary Tests." One of us (for preliminary communication see Rimington, 1938a) separated the porphyrins from the urine and faeces by the methods outlined later.

The serum calcium was 9.3 mg. (October 24), the blood urea 52 mg. per 100 c.cm. (October 4), and no abnormal pigments were detected spectroscopically in the plasma or in the laked red cells (October 24).

CLINICAL HISTORY

The abdominal symptoms became worse, and occasionally the patient complained of pain in the arms, legs, and neck. By October 2 the cramp-like abdominal pain was so severe and the vomiting so frequent and distressing that he begged for something to be done. At this time a hard mass was felt in the epigastrium, which was slightly movable. A surgeon was called in, and agreed to operate, though very reluctantly, on the grounds that the lump was probably a malignant mass and the case hopeless. In spite of the fact that we knew there is intense spasm of the intestinal tract in acute idiopathic porphyrinuria, the one of us who was responsible for the patient's welfare urged operation because of the pain, the mass in the abdomen, and the fact that in many books porphyrinuria is described as associated with certain diseases of the stomach. It is possible that the last clinical point is not sound, and that there is no conclusive evidence of the association of organic disease of the stomach with clinical porphyrinuria; in that case the statement repeated in one textbook after another should be deleted.

A laparotomy was performed on October 12. The stomach was in extreme contraction, suggesting at first a leather-bottle stomach, this producing the apparent tumour. Otherwise nothing abnormal was found. The patient recovered quickly, and for some unknown reason was entirely free from symptoms for several days, and there was much less porphyrin in his urine. On October 17 the pain returned, and thereafter the porphyrinuria increased.

On October 19 Dr. Denny-Brown kindly made a neurological examination. He found no definite sensory changes, no convincing focal wasting, and only a general weakness. All the reflexes were brisk; there was no tenderness of muscles and no loss of vibration or position sense. He did not think there was a true peripheral neuritis, and felt certain that the pains were not neuritic.

The patient's condition rapidly deteriorated, and he begged for more and more opium. There is little doubt that he suffered acute and intolerable pain, and it would have been kinder to increase the dose of omnopon, which was kept within reasonable limits in the hope of recovery. Not obtaining the complete relief from pain for which he asked, the patient wished to be discharged, and on October 24 was transferred to the care of his own doctor. On October 25 he was unable to use his arms, and there was great weakness in the hands and legs. On October 27 his temperature was still normal, but he developed a cough. Increasing asthenia led to his death on October 28. A necropsy was performed, but unfortunately the pathologist was not aware of the findings in hospital, so there was no special study of the bones or central nervous system and no material was kept for chemical investigation. We do not consider, therefore, that a report of the findings would be of any value. (For post-mortem histology, cf. Geissler, 1939.)

During the patient's stay in hospital vigorous symptomatic treatment was instituted, which need not be detailed. Eight intravenous injections, each of 10 c.cm. of 10 per cent. calcium gluconate, were given, but afforded no relief.

Simple Urinary Tests in Porphyrinuria

The colour of the urine varies from brown to red, and is often described as "port-wine." Sometimes the fresh urine is more or less normal in colour, but slowly darkens so that in a few hours it is obviously abnormal, and ultimately may become deep reddish brown or almost black. This is due to the excretion of porphyrinogens and other chromogens of unknown constitution which are slowly changed in light and air to the corresponding porphyrins and pigments. It has been recognized for many years that the pigmentation is due mainly to the unknown pigments. To produce the change rapidly the urine may be heated at 100° C. for half an hour; the darkening starts in a few minutes and, so far as our limited experience goes, is complete in half an hour. Potassium permanganate and other oxidizing agents have been recommended to produce the change, but in our hands, though they might cause darkening, they did not produce porphyrins judging from spectroscopic examination. We therefore recommend that in routine examinations the urine be heated at 100° C. for half an hour before it is concluded that there is no gross porphyrinuria.

It is, of course, the examination with the spectroscope that establishes the diagnosis of porphyrinuria. In a typical case the four-banded spectrum of alkaline porphyrin is seen when the urine is examined in an ordinary boiling-tube (about 1 inch in diameter). The alkaline spectrum is seen at all natural reactions of urine; the acid spectrum is produced only by the addition of a mineral acid. Obviously the concentration of porphyrins varies, and it is necessary to have a working rule as to how thick a layer of urine shall be viewed before declaring a negative result. We suggest that clinical porphyrinuria can safely be excluded if a 4-inch or 5-inch layer* of urine does not show the absorption bands (compare Günther, 1922.) The effect of heat should, however, be tried as mentioned above; in highly pigmented urines it is impossible to see through so thick a layer, and the simple extraction method given below must be tried before concluding that there is no porphyrin.

A second important point in the spectroscopic examination is that occasionally the porphyrin is excreted as a metal complex, and the urine shows two absorption bands in almost the same positions as the bands of oxyhaemoglobin, instead of the typical four-banded spectrum. Careful observation reveals the fact that the β band is the more intense, whereas with oxyhaemoglobin it is the α band which is the darker. Wavelength measurements may be used to differentiate, but to make this conclusive it is necessary to use a reversion spectroscope (see later). Since the porphyrins contain no iron and are not proteins, negative chemical catalytic tests for blood (guaiac, pyramidon, reduced phenolphthalein, etc.), and

* For a convenient method of varying the thickness, see *Biochem. J.*, 1938, **32**, 933.

negative tests for proteins, rule out haemoglobin; but, naturally, positive tests do not exclude a metallo-porphyrin. Confirmation of the presence of a porphyrin or metallo-porphyrin is easily obtained by adding a few drops of concentrated HCl or H_2SO_4 to about 10 c.cm. of urine, when the acid spectrum is obtained.

As mentioned above, when the porphyrins are dilute or the urine is highly pigmented it is necessary to extract them for certain recognition. A simple method is to acidify about 15 c.cm. of urine with a few drops of glacial acetic acid and then to add about 5 c.cm. of ethyl acetate or of amyl alcohol. After shaking thoroughly, the mixture is centrifuged and the upper layer is transferred to another tube and examined spectroscopically, if necessary in a thick layer (cf. previous footnote). Shaking the extract with one drop of HCl produces the acid spectrum. This method does not give positive results with normal urines, but will detect slight increases in porphyrin excretion.

Some Special Investigations of the Urine and Faeces

By spectroscopic means it is impossible to differentiate between the series I and the series III isomers of the same porphyrin; indeed, the data already given show that careful measurements of wave-lengths are required to distinguish between the uroporphyrins and coproporphyrins, for the maximum difference between corresponding absorption bands is only of the same order as that between the bands of oxyhaemoglobin and of carboxyhaemoglobin respectively (about 60 A.U.). A differential estimation of the isomers, therefore, necessitates first a separation of the porphyrins from the urine.

Several methods have been proposed for this purpose. Nebelthau (1899) found that the addition of acetic acid to urines containing much porphyrin caused the formation of a slowly settling precipitate in which nearly all the porphyrin was included. To Garrod (1894–5) we owe one of the earliest procedures of a roughly quantitative nature. To 100 c.cm. of urine was added 20 c.cm. of a 10 per cent. solution of sodium hydroxide. This produced a precipitate of the earthy phosphates, upon which much of the porphyrin was adsorbed. After filtration the precipitate was washed off the filter paper by water and sufficient acid and alcohol added to dissolve it completely. The solution then showed the acid porphyrin spectrum. A calcium precipitate was used to carry down the bulk of the porphyrin as an adsorbate by both Salkowski (1890–1) and Dobriner (1936). Barium precipitates have been used for a similar purpose, and were also investigated by Salkowski. In our own case four volumes of 10 per cent. barium chloride added to ten volumes of urine produced a precipitate containing almost all the porphyrin, but it is probable that irregularities would be observed were this method to be tried upon a number of different urines (see below). Fink (1937), in his work on the isolation of the normal urinary coproporphyrin, employed with success a thick layer of paper pulp to adsorb porphyrin from the large bulk of urine acidified with acetic acid, and Grotepass (1938) similarly filtered large quantities of urine through infusorial earth in order to obtain enough pigment for chemical identification.

By far the most convenient and reliable technique, however, is that of chromatographic adsorption, using the Tswett column, and first applied to the particular case of the extraction of porphyrins from urine by Waldenström (1935); this is the method we have employed in the investigation of the present case and is described below in full.

As has already been pointed out, pathological urines may contain both uroporphyrins and coproporphyrins. A fundamental difference in physical properties exists between these two pigments—namely, the coproporphyrins may be extracted by ether from an aqueous solution solidified with acetic acid, while the uroporphyrins do not pass up into the ether phase under these conditions. A preliminary separation may thus easily be effected. A further difference exists between uroporphyrins I and III, in that the latter, as discovered by Waldenström, Fink, and Hoerburger (1935), may be removed from a carefully acidified solution by repeated extraction with ethyl acetate. Uroporphyrin III was thus obtained in pure form for the first time from the urine of acute idiopathic porphyrinurics. Fischer's (1926) method for the isolation of the coproporphyrins from urine, faeces, serum, etc., is based upon the acetic acid–ether solubility discovered by Saillet (1896); a similar technique has been used by Schumm. Briefly, the material is strongly acidified by acetic acid and then shaken with successive quantities of ether until all the porphyrin is extracted. The combined ether extracts are washed with water to remove most of the acetic acid, and the porphyrins recovered by shaking with dilute hydrochloric acid. According to the concentrations of acid used, a further separation may be achieved of the different ether-soluble porphyrins present, since, for example, coproporphyrin can be extracted completely by 0.5 per cent. HCl but protoporphyrin not until an acid concentration of 3 or 4 per cent. is used.

In the following description of the methods by which we isolated the individual porphyrins from the urine and faeces of our patient these methods find illustration.

Preliminary Tests upon the Urine

When viewed by a direct-vision spectroscope the red-brown urine voided by this patient exhibited two well-defined absorption bands at approximately 580 and 542 mμ. (Using the same instrument, the readings for oxyhaemoglobin were 577; 540 mμ.) The addition of a reducing agent caused no change, but upon acidification with a few drops of concentrated hydrochloric acid an immediate shift was seen to approximately 600 and 556 mμ. There was strong continuous absorption in the blue end of the spectrum and also in the far red region. The two-banded spectrum is closely similar to that of the zinc complex of uroporphyrin.

Isolation of Coproporphyrins and Chromatographic Separation applied to the Urine Residue

Two litres of urine (collected October 4 to 10) were acidified with 100 c.cm. of glacial acetic acid and shaken twice with 1-litre portions of ether. The ether phase was washed well with water and the porphyrin then removed by shaking into 1 per cent. hydrochloric acid. This solution showed absorption bands at 595 and 549 mμ. Spectrophotometric comparison with a standard coproporphyrin solution gave the yield as 0.306 mg. By addition of potassium acetate and shaking with ether the porphyrin was transferred back again to the organic solvent, which exhibited the neutral four-banded spectrum of coproporphyrin 625, 570, 532, 498. The solution was evaporated to dryness, esterified by methyl alcoholic hydrochloric acid, and the dry ester treated with anhydrous ether, in which coproporphyrin III ester is soluble but coproporphyrin I ester insoluble. All dissolved except a small unweighable quantity, which was, however, crystallized from hot chloroform-methyl alcohol and obtained in the form typical of coproporphyrin I methyl ester, melting-point 230° to 240° C. (Fig. 8). The ether solution was concentrated to low volume in a weighed tube and then stoppered and set aside in the ice-chest. The crystals which formed were washed sparingly with dry ether and then with petrol: weight, 0.3 mg.; melting-point, 172° to 174° C. (Fig. 8). The coproporphyrin fraction of the urine thus consists principally of coproporphyrin III (0.15 mg. per litre), together with a trace of coproporphyrin I.

The residual urine, after removal of the ether-soluble porphyrins, was allowed to filter slowly under gentle suction through a column of alumina (Merck's "nach Brockmann") in a vertical glass tube measuring 2 × 30 cm. The first filtrate was yellow, but a brownish-red pigment followed which showed no absorption bands in the red or green, but the broad band of urobilin in the blue region of the spectrum. When all the urine had passed through the column, the chromatogram was washed by percolation with 1 litre of 5 per cent. acetic acid, which extracted the last of the reddish-brown pigment. Glacial acetic acid now removed a small quantity of pigment, migrating as a narrow zone and emerging as a mahogany-red solution with two faint bands at 580 555 and 530. On standing in the ice-chest the liquid deposited the substance responsible for this spectrum, which proved to be uroporphyrin metal complex.

After washing out the acetic acid from the column with water, dilute ammonia (50 c.cm. of specific gravity 0.88 to 200 c.cm. of water) removed the porphyrins. First came a deeply coloured zone emerging as a dark red solution consisting mainly of the metal complex (two-band spectrum), and following this the main bulk of the material in a bright red solution in which the four bands of the alkaline spectrum of uroporphyrin were very sharply defined. Since any metal in complex combination with the porphyrin is eliminated by the strong acid used during the process of esterification, the above solution and the fraction consisting mainly of metal complex (which was put once more through the chromatographic process to remove some accompanying brown material) were combined and acidified by acid to *p*H 3.7. On standing, the porphyrin material was precipitated completely. It was centrifuged off, washed with acetate buffer solution of *p*H 3.7, and dried *in vacuo*, then esterified and the ester crystallized from hot chloroform-methyl alcohol. It separated in the form of very fine hair-like needles usually in aggregates (Fig. 8) and having a melting-point of 258° C., not depressed by admixture with uroporphyrin III methyl ester. The total yield was 42 mg., corresponding to 21 mg. per litre of urine. Uroporphyrin I could not be detected.

	Yields of Methyl Esters (mg. from 2,000 c.cm.)	Melting-points of Methyl Esters
Coproporphyrin I	minute trace	230° to 240° C.
Coproporphyrin III	0.3	172° to 174° C.
Uroporphyrin I	*nil*	—
Uroporphyrin III	42.0	258° C.

Identification of the Metal Present in Complex Combination

Using a calibrated reversion spectroscope the wave-lengths of the bands due to the metallo-porphyrin were 5,782; 5,406 A.U. (oxyhaemoglobin in the same instrument was 5,769; 5,389). Messrs. Adam Hilger, Ltd., kindly took spectrograms of the materials absorbed on a barium precipitate of the patient's urine and of a normal urine, and concluded that no doubt there was a greater concentration of zinc in the patient's sample.

The acid liquids from the esterification process, containing the metal which had been removed from its combination with the porphyrin, were evaporated to dryness, taken up in a little water, and filtered. Spot tests applied to this solution were positive for Zn, Fe, and Cu. It is thus possible that more than one porphyrin metal complex was present, although the observed absorption spectrum corresponded most nearly to that of uroporphyrin zinc complex, for which Mertens (1937) gives 571.5; 536 mμ. (For the coproporphyrin zinc complex Kapp (1939) gives 575; 539. Kapp and Coburn (1936), however, mention that higher dilutions gave 578; 541.) Zinc in complex combination with porphyrins has been observed by other workers, among whom may be mentioned Turner (1938) and Derrien and Cristol (1930). There is no doubt that the metal complex was present in the urine as voided, since a specimen obtained immediately after micturition still exhibited the characteristic two-banded spectrum. On the other hand the chromatographic results make it quite clear, also, that some of the uroporphyrin was not so combined. All the urine was collected in porcelain or glass, and never came into contact with metal.

Isolation and Identification of Porphyrins from the Stools

There was available 275 grammes of material (October 14 to 18) having a moisture content of 64.9 per cent. The mass was ground up with about 1 litre of acetone and, after standing for some time, this solvent was filtered off and replaced by a further 1 litre of acetone. The defatted residue was then ground with 100 c.cm. of glacial acetic acid, 1 litre of ether added, and the mixture shaken in a stoppered jar for one and a half hours. After decantation the extraction of the residue was repeated, using 50 c.cm. of acetic acid and 1 litre of ether. The combined ether extracts were filtered through a sintered glass filter-funnel into a large separating funnel and washed several times with water. Shaking with six 100-c.cm. portions of 5 per cent. HCl removed the porphyrins. Since there was some emulsification, the extract was cautiously warmed on a water bath and stirred until the ether had been removed. There remained a clear deep red liquid containing only a little suspended matter which could be easily filtered off. The porphyrin was returned to ether with the aid of potassium acetate, and the ether solution, after washing, extracted first with 0.5 per cent. (coproporphyrin fraction) and then with 5 per cent. hydrochloric acid (protoporphyrin fraction).

The 0.5 per cent. acid extract was freed from some urobilin, etc., by shaking with chloroform, and the quantity of porphyrin determined spectrophotometrically: yield 2 mg. The protoporphyrin fraction (5 per cent. acid), after a little further purification, gave a solution containing 2.4 mg. of porphyrin. The total yield thus corresponded to 4.56 mg. per 100 grammes of dried faeces, or 1.6 mg. per 100 grammes of undried stool, and approximately half was coproporphyrin.

By esterification and separation with anhydrous ether as described above it was shown that there was only a trace of material crystallizing like coproporphyrin III, the main fraction (1 mg. from 1.1 mg. of crude esters) being identified as coproporphyrin I with ester melting-point 245° to 247° C. Examination of the stool residue for uroporphyrin failed to reveal any trace of this pigment.

Recovery and Purification of Urinary Porphyrin from a Barium Chloride Precipitate

The chromatographic process can be relied upon, but demands much time and attention. Our results with barium chloride precipitation followed by certain innovations are considered, therefore, to be worthy of record, because pure uroporphyrin ester was readily obtained in good yield. To 7.3 litres of urine was added 2.2 litres of 12 per cent. barium chloride solution, and the fine precipitate collected upon a large Buchner funnel, washed by water and then by methyl alcohol. It was then suspended in methyl alcohol containing 2 per cent. by weight of sulphuric acid and the mixture refluxed on the water bath for some hours. After filtering off the deeply coloured liquid by suction, the residue was boiled with a fresh lot of this mixture, the process being repeated yet a third time. The three extracts were combined and placed in a large separating funnel with about 300 c.cm. of chloroform. Much water was then added and, after shaking, the chloroform layer was run off. Extraction with further smaller quantities of chloroform removed all the porphyrin ester from the acid aqueous layer. This crude chloroform solution was brownish red in colour and quite clearly contained much pigment in addition to porphyrin ester. To it was added twice the volume of petroleum ether, and the mixture was shaken repeatedly with 1 per cent. hydrochloric acid until no further brown material was either extracted or precipitated at the interface. This amorphous brown impurity was filtered off, and the remaining chloroform solution shaken repeatedly with 10 per cent. hydrochloric acid, which removed the porphyrin quantitatively, affording a clear deep red solution (1.25 litres). It was allowed to stand overnight at room temperature for complete hydrolysis to take place. 100 c.cm. of 50 per cent. sodium hydroxide was added and enough saturated potassium acetate solution (150 c.cm.) to bring the *p*H to about 3.7, when there was an immediate precipitation of the free porphyrin. This was centrifuged off, washed by acetate buffer solution of *p*H 3.7, then with water, and dried *in vacuo*. Re-esterification and crystallization from hot chloroform-methyl alcohol gave 64.5 mg. of well-crystallized uroporphyrin III methyl ester, melting sharply at 260° C.—that is, approximately 9 mg. per litre of urine.

Discussion

Acute idiopathic porphyrinuria is clearly recognized in Germany and elsewhere on the Continent; it is being increasingly reported in America, but even to-day it is scarcely mentioned in British literature. Yet some of the early cases were published in this country, under such titles as "Haematoporphyrinuria not due to Sulphonal"—

for example, Calvert and Garrod (1901), Garrod (1904), Brown and Williams (1909). Possibly the negative form of title was partly responsible for lack of interest; or perhaps the fact that it was noted that not all cases of porphyrinuria were accompanied by grave symptoms led to the conclusion that the porphyrinuria was incidental and of little importance clinically; then again, sulphonal had just been recognized as a cause of porphyrinuria, and it was not always certain that the patient had not taken this or a similar drug; also, several patients were diagnosed as suffering from abdominal diseases and the porphyrinuria was regarded as secondary.

The modern attitude is that, if a patient has abdominal pain, constipation, and vomiting, with a brown or red urine containing porphyrin which can be detected without special methods of separation and concentration, the possibility of "acute idiopathic porphyrinuria" should be considered. A difficulty is that in certain patients the symptoms and porphyrinuria may not be striking at first—hence some authors would make a fourth group of "chronic porphyrinuria"—and there may be several mild attacks before one which is grave establishes the diagnosis. None the less, there can be no doubt of the existence of a separate clinical group of porphyrinurics of the acute idiopathic form. The diagnosis is important in practice because it prevents unnecessary operations: in our patient there was no clear-cut history of the urine being red at the time of the appendicectomy in 1937; but the laparotomy in 1938 was unnecessary, as now we all agree, although, as noted previously, he was temporarily better after it. The decision whether to operate or not will remain difficult in future cases, for no physician wishes to be responsible for stopping an operation which could have done good. In the presence of grave abdominal symptoms it is the significance attached to the porphyrinuria which settles the issue: we repeat that, if the urine is brown or red and contains porphyrins that can be detected without special methods of separation and concentration, the diagnosis of acute idiopathic porphyrinuria may be made. But the responsible physician may still hesitate, for he knows that the condition is rare, and justifiably may refuse to be guided largely by a laboratory report. He will be influenced much more if the tests for porphyrins are quantitative: in acute porphyrinuria several milligrammes are excreted in the twenty-four hours' urine, whereas in health 0 to 50 μg. (1 μg. or 1γ = 1/1000 mg.) and in the lesser grades (see below) of porphyrinuria only fractions of a milligramme are present.

It is interesting that there are important differences chemically as well as clinically between the three types of porphyrinuria. In the acute idiopathic form the urinary porphyrins belong mainly to series III, whereas in congenital porphyrinuria they are largely series I compounds.

	Copro I	Copro III	Uro I	Uro III
Health	Very slight trace	Very slight trace	Nil	Nil
Congenital porphyrinuria	+	Trace	+++	Trace
Drug porphyrinuria (sulphonal, etc.)	+	? Trace	+++	? Trace
Acute idiopathic	Very slight trace	+	Nil	+++
Lead poisoning	? Slight trace	+	Nil	Nil

Congenital porphyrinuria is distinctive in several respects; there are marked photosensitization and pigmentation of bones and teeth, neither of which is present in the other types (see under heading "Chief Signs").

Were it not that series I porphyrins apparently predominate in sulphonal porphyrinuria too (Fischer and Duesberg, 1932; Fischer and Libowitzky, 1936), it might have been suggested that the distinctive features of the congenital form were due to the series I isomers, which are known to be more active as photosensitizers. It is curious that in sulphonal porphyrinuria uroporphyrin I, whereas in the acute idiopathic form uroporphyrin III, predominates, according to Fischer and his collaborators, for otherwise the two groups have almost everything in common; indeed, they are often classified as subgroups of the same "toxic" group. In contradistinction to the congenital form, both show in the advanced stages similar abdominal and nervous symptoms.

One point emerges quite clearly, however, as indicated in our section on the chemistry of the porphyrins. It is inconceivable that the excreted series I porphyrins can be derived from the *breakdown* of haemoglobin or other series III compounds. It is possible that where series III isomers are excreted these may have had such an origin, although in modern literature the tendency is to assume that it is at some stage in the *building up* of haemoglobin, etc., that an error or toxic effect has occurred which causes an excessive excretion of these porphyrins also. Experiments by one of us at present in progress may help to throw light upon the origin of the series III porphyrins in various pathological conditions (cf. Rimington, 1938, b; 1939).

Summary

"Clinical porphyrinuria" is defined; it includes the congenital form, that due to drugs such as sulphonal, and the acute idiopathic type, of which a case is described because it is not well recognized in British literature.

A summary is given of the chemistry of the porphyrins, for upon that depend not only the simple tests used in clinical laboratories but also the special investigations being made at several centres in the hope of throwing light on the synthesis of haemoglobin and the metabolism of related pigments.

The urine may contain uroporphyrin or coproporphyrin or both, and two isomers of each (I and III) have to be considered; methods for the separation and identification of these are described; in our case of acute idiopathic porphyrinuria, uroporphyrin III accounted for about 99 per cent. of the total urinary porphyrins.

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CAUSES OF POST-PARTUM HAEMORRHAGE*

BY

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The causes of post-partum haemorrhage can be divided into two main groups. The first and larger consists of cases where an otherwise normal uterus has been treated unkindly by Nature or other agencies; the second includes cases in which there is some pathology or possibly a misplaced placental site.

Group I: The Normal Uterus

Many primiparae after a spontaneous delivery have cervical lacerations, a few of which extend above the level of the vaginal vault or have some degree of perineal laceration. It is a rarity for such cervical or perineal lacerations to give rise to alarming or dangerous bleeding. If, however, an incompletely dilated os is forcibly stretched by the premature application of forceps or an injection of pituitary extract, or by an accelerated breech delivery, the cervical lacerations are considerably increased, and indeed may assume the nature of a minor degree of rupture of the uterus. Too rapid stretching of the perineum by forceps or pituitary extract or by imperfect control of the head during a spontaneous delivery also results in severe trauma. It is surprising how seldom severe bleeding occurs even in these cases, although there may be considerable shock.

The most important bleeding point is the placental site. Prolonged or obstructed labours exhaust the uterine muscle and predispose to an imperfect third stage as regards the mechanism and control of bleeding. Mismanagement of an otherwise perfectly normal third stage is a prolific cause of difficulty and bleeding at this time. The uterus if well treated performs its work satisfactorily. At the Tarnier Clinic in Paris I noted that the women were delivered on their backs, and the resident doctor left them alone after delivery during the third stage. He returned from time to time to palpate the uterus. This procedure struck me as somewhat casual, and as different from what is the general rule in this country, where the patient is usually delivered on her left side and may remain in this position for some time before she is turned on her back to await the separation of the placenta, and where massage of the uterus is often performed.

A study of some hundreds of cases of incomplete B.B.A.s on the hospital district, where the baby had been born but the placenta had not come away by the time the nurse arrived, showed that in only one instance was a slight post-partum haemorrhage reported. These women had no skilled attention before the arrival of the nurse or district doctor.

A series of cases injected with 1 c.cm. of pituitary extract immediately after the delivery of the baby, with a view to studying the effect on the third stage and the amount of blood loss, revealed that the only cases in which there was any trouble were those which had been allowed to remain unduly long on their side after the injection was given or in which the uterus had been massaged. It is well known that a uterus which is kept out of the pelvis either at laparotomy or by means of a full bladder tends to bleed. If a patient lies for long on her side before the placenta comes away the uterus tends to fall up into the abdomen, with disturbance of its neuro-muscular mechanism.

With the rarest possible exceptions I deliver patients in the lithotomy and cross-bed position aided by a Clover's crutch. Unless there has been a long labour and much anaesthetic has been used I do not allow anyone to touch the uterus, but proceed to repair any laceration or episiotomy wound which may be present and merely lightly palpate the fundus from time to time to determine if the placenta has separated. The third stage is uniformly most satisfactory, and there is a minimum of blood loss. The time factor is a most important one, especially at night. The time of delivery should be noted, and at least ten to fifteen minutes allowed to elapse—unless there is bleeding—before deciding whether the placenta is ready for expulsion or not.

Occasionally one meets with post-partum haemorrhage of an insidious nature if the placental separation is not going according to plan. This is most likely to be found if the patient is nervous or has had a long and tiring labour or a lot of anaesthetic. The placenta in these cases has left the fundus but has not yet been completely detached from the lower part of its site. The physical signs are misleading. An attempt at expression fails to deliver the placenta, but a mass of blood clot the size of a small orange is squeezed out. There is no active continuous bleeding, but merely expulsion of a mass of blood clot each time an attempt is made to express the placenta. Each clot represents several ounces of blood and the patient slowly deteriorates. It is a sound rule to remove these placentae manually while the patient's condition is good.

I have never seen sepsis arise where a manual removal of the placenta followed by an intra-uterine antiseptic douche was done while the patient was in fairly good condition. Delay in doing this owing to a dread of causing sepsis or because the blood loss is intermittent and slight, and not continuous and severe, is responsible for many bad results.

Group II: The Pathological Uterus

In the other group of cases there is some intrinsic mischief in the uterus. One such, a multipara, was referred to me as her two previous confinements had been

* Contribution to a discussion in the Section of Obstetrics and Gynaecology at the Annual Meeting of the British Medical Association, Aberdeen, 1939.

followed by a most profuse haemorrhage after the third stage was complete. I made a point of personally attending her in the maternity ward. After the labour and the third stage, which were perfectly normal, she suddenly started to bleed profusely from the placental site, which was checked only by prolonged bimanual compression and the injection of pituitary extract.

The explanation of such a case is extremely difficult, as the course of labour, and also the third stage, on each occasion appeared normal. This in my opinion would rule out disease and also deficient retraction. There was no suggestion of placenta praevia. I think it may be explained by an experience I had when curetting a patient who had been bleeding for many weeks following a miscarriage at the fourth month. The curetting was done with a sharp curette as there were no retained fragments. Following the curetting she bled so profusely and so persistently in spite of treatment that a vaginal hysterectomy was performed. Section of the uterus showed a large vessel the size of the normal uterine artery passing through the musculature to the placental site.

I suggest that some of those rare and unaccountable haemorrhages from an apparently normal and empty uterus may be due to the presence of some unusually large arterial trunks in close proximity to the placental site. Occasionally cases which have been treated for ante-partum haemorrhage of the accidental type have a serious post-partum haemorrhage. Fortunately, the more serious cases of this condition, especially where the bleeding is concealed, are operated on, and this enables the operator to estimate the extent of the damage to the musculature, and whether or not it is safe to conserve the uterus without risking a severe and fatal post-partum haemorrhage. Many of these cases, however, are dealt with by domestic measures and have a spontaneous delivery or one aided by forceps, and there is no way of assessing the condition of the uterus. In one such case where there had been some concealed haemorrhage the third stage concluded with a most profuse and continuous haemorrhage. It was quite impossible to perform bimanual compression, as the empty uterus lay relaxed and flaccid in the abdomen and no mass of muscle substance could be squeezed. She died before a laparotomy could be performed. All cases of accidental haemorrhage, especially of the concealed type, should, if possible, be dealt with in a nursing home or hospital.

In cases of placenta praevia there is always the risk of a severe post-partum haemorrhage, but fortunately it is a rarity. I have met only one such case which failed to respond to any of the usual routine procedures, including bimanual compression. In this connexion it must be borne in mind that the rapid extraction of a breech baby in such a case may very readily cause a tear of the cervix and lower uterine segment and result in profound and even fatal haemorrhage.

Conclusion

As regards the problem of post-partum haemorrhage in general, with the exception of the rarer conditions, if the uterus is handled properly it will very rarely give rise to anxiety on account of bleeding, and with the rarest possible exceptions an empty uterus will not bleed except from a cervical laceration. I am against packing a uterus. The rule is to empty the uterus if the bleeding is to be stopped. The pathological uterus which is deficient in contractile and retractile power is less likely to respond if it is distended. I never repair cervical lacerations, and would perform bimanual compression followed by a hot douche in preference to packing if faced with serious bleeding from such a lesion. My experience of cases sent into hospital with the vagina reported to have been packed before admission would in itself make me opposed to advocating deeper tamponage.

I consider that many of the cases at present treated by blood transfusions would do equally well if they were given gum- or glucose-saline.

OPHTHALMIC INJURIES FROM MUSTARD GAS (D.E.S.)

BY

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Recent letters in the *Journal* are evidence of the interest taken in ophthalmic lesions due to mustard gas. I felt, in the circumstances, that certain information on this subject collected by me in the last few years might be acceptable to others. The table below is compiled mainly from figures in the *Medical History of the Great War*, already quoted in part by Sorsby. Thuillier (1939), while giving the total number of British mustard gas casualties as not fewer than 150,000, states that the total number of eye casualties is unknown. In the *Official History of the War: Medical Services* (1923), however, it is stated that "the great majority of D.E.S. casualties had eye burns." Yet out of this large number only ten had persistent impairment of vision after the war—this number rising from recurrent corneal trouble to thirty-four in 1937.

Reagent Mustard	Grading	%	Onset	Physical Signs	Symptoms	Treatment	Incapacity
Vapour <1/10,000,000	Mild	75	2–48 hrs.	Conjunctival congestion	Irritation and photophobia	2% $NaHCO_3$; paroleine; paper shade	1–4 weeks
Stronger vapour 1/20,000	Intermediate	15	2–48 hrs.	Ditto + chemosis	Ditto more severe	Ditto + 1% ung. atrop.	4–6 weeks
Concentrated vapour and liquid	Severe	10	May be almost immediate	Ditto + blistered lids and white band across cornea	Ditto	Ditto + treatment for infected ulcers and symblepharon	8–16 weeks

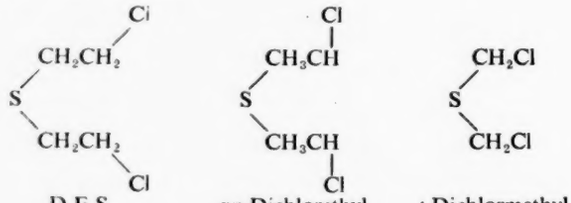
The burn is divided into three stages by Bonnefon (1939): the period of impregnation, the established burn, and the period of decrescence. It is the period of impregnation which is most interesting therapeutically, as once the burn is established there appear to be very few curative possibilities other than the treatment tabulated above. The difficulties in countering D.E.S. in the period of impregnation are as follows:

1. *Liposolubility.*—The gas is even more readily absorbed by the cornea than by the skin, and Sorsby (1939) has stated that if "drops" of liquid D.E.S. are placed experimentally on both corneae of a rabbit, and one eye is irrigated, the lesions are identical in both next day.

2. D.E.S. is relatively insoluble in water.

3. Except for its peculiar and specific intracellular reaction it is not an active substance chemically. Dichlormethyl sulphide and $\alpha\alpha$-dichlorethyl sulphide are equally liposoluble,

very similar in constitution, and just as easily broken up into hydrochloric acid under conditions resembling the intracellular, but are non-vesicant.



D.E.S. *aa*-Dichlorethyl sulphide Dichlormethyl sulphide

4. The eye will only tolerate in low concentrations reagents active enough to attack D.E.S.

As we may have an opportunity in the near future to try the effect of different remedies on the human subject, for those who may become dissatisfied with the accepted treatment I have included in the second half of this paper some notes on the chemical possibilities.

For the Established Burn

I find that Hederer and Istin (1935) have suggested the following applications, which I have not seen quoted elsewhere. These may be helpful in unsatisfactory cases which have not responded to the regular treatment. I have no other evidence as to their efficacy, however, than their quotation in the volume mentioned, and their recommendation by René Onfray in a personal communication in 1936. (1) For photophobia: 2 per cent. pilocarpine drops. (2) For pain and chemosis, ophthalmic ointment Z-1:

	Grammes
Orthoforme (benzocain)	5
Ichthosulphol	2
Sodium ichthosulphol	1
Thigenol	1
Sodium bicarbonate	1.5
Borax	1
Sodium sulphate	0.25
Magnesium sulphate	0.25
Excipient	ad 100

The benzocain does not produce corneal desquamation.

For the period of decrescence after the main infection has subsided they have suggested the use of ophthalmic ointment Z-2:

	Grammes	
Medicinal scarlet red, insoluble	2	
Methylene-blue, purified	0.5	
Bismuth subgallate	1.5	
Liquid paraffin, neutral	20	q.s., ad 100 gm.
White vaselin, neutral	20	
Anhydrous lanolin	60	

Period of Impregnation: Antidotes

MECHANICAL REMOVAL

Oil, grease, and soapy solutions which remove the liquid from the skin have been shown to reduce the effects up to ten minutes after exposure, while, again, oily substances on the skin have a definite temporary prophylactic effect, clearly demonstrated experimentally (Sollman, 1919). I know of no experiments in which oily substances are used as a prophylactic in the eyes, and the skin experiments are not directly applicable, as the grease was removed after a time. The prophylactic effect may merely represent the partition coefficient of mustard gas between grease and human skin. While the vesicant effect of the tears in the earliest stages, custom, and the incidence of secondary infection suggest that ocular irrigation reduces the severity of the burn, the efficacy initially, owing to the rapidity of absorption of D.E.S., is open to doubt.

ADDITION COMPOUNDS OF D.E.S.

These are formed by *p*-toluene-sodium-sulphochloramide and toluene-sulphodichloramide (monochloramine-T and dichloramine-T). The end-product isolated by Mann and Pope (1922), *ββ*-dichlorodiethyl-sulphide-para-toluene-sulphonylimine, is in spite of its imposing name relatively inert. Dichloramine-T also breaks up lewisite into harmless oxidation products. Monochloramine-T has a solubility of 1 in 7 in water, and has been used as an antiseptic on mucous membranes in a 0.25 to 2 per cent. solution. It has also been employed as a 1.5 per cent. ointment and as a 1 in 500 aqueous solution for bi-daily irrigation in cases of trachoma.

Dichloramine-T.—A 0.5 per cent. solution in chlorcosane (chlorinated medicinal paraffin) has been used in trachoma. This solution is stable for three days only and should not be employed if there is a precipitate. Warthin *et al.* (1918) claim that it has a definite prophylactic and therapeutic effect on rabbits' eyes when exposed to D.E.S. and that its effect on human eyes burnt by D.E.S. is beneficial. I can, however, find very little information elsewhere about its use.

OXIDATION OF D.E.S.

Oxidation of D.E.S. produces the less irritant tetrachlorodiethyl sulphoxide and the non-irritant sulphone. The eye, however, will not tolerate concentrations of reagents which leave the skin unaffected. Among possible applications are:

(*a*) 1 in 10,000 potassium permanganate.

(*b*) Diluted eusol solution as used by St. Margaret's on cases of ophthalmia neonatorum, and which I have employed on hypopyon ulcers for some time: it is equivalent to a 1 in 10 strength ordinary eusol solution. The prescription of ophthalmic eusol (J. D. M. Cardell, personal communication, 1936) is as follows. Two ounces of boric crystals and 2 oz. of chlorinated lime are dissolved in half a gallon of water. The solution is allowed to stand for twenty-four hours. It is then filtered and diluted with an equal quantity of water. This is kept as a stock solution. For use in the eyes nine parts of water are added to one part of stock solution, a further filtration being sometimes necessary. Unfortunately, I found only recently, the composition of the final aqueous solution is: hypochlorous acid, 0.027 per cent.; calcium borate, 0.128 per cent.; calcium chloride, 0.017 per cent. Some might object to the application of a solution containing calcium to a lesion in which punctate keratitis develops and extends after the first ten minutes.

(*c*) *Milton.*—This is a proprietary preparation of sodium hypochlorite, 1.01 per cent.; sodium chloride, 16.8 per cent.; with traces of sodium sulphate, sodium chlorate, sodium carbonate, and calcium chloride. It also is open to the objection that it contains calcium. According to the directions supplied with the bottle ten drops are to be placed in half a glass of cold water, as stronger solutions irritate the eye. If an eight-ounce tumbler is assumed, then this is a dilution of 1 in 152.

The free chlorine available in the latter two solutions and in Daufresne's solution is: eusol, 0.4 per cent.; Milton, 0.47 per cent.; Daufresne's solution, 0.45 per cent. This would suggest that it would be possible to utilize a much stronger solution of Milton than advised on the bottle if one were anxious to introduce more free chlorine, and that Daufresne's solution (liq. sod. chlorinat. c̄ sod. bicarb.) can be used in a slightly greater dilution than eusol, and with the advantage that it would be less likely

to contain calcium. All these solutions contain hypochlorites and are unstable to a varying extent.

HYDROLYSIS OF D.E.S.

Although sodium bicarbonate solution was probably suggested originally as an eye-wash in the hope of producing hydrolysis, and irrigation by saturated boric acid followed by sodium bicarbonate ointment (Kinttof, 1939) is still the German first-aid treatment, it is doubtful if hydrolysis of mustard gas in the conjunctival sac plays much part in reducing the severity of the lesion, for the following reasons:

(*a*) At 10° C. mustard gas has a solubility of only 0.07 per cent. in water. At body temperature 25 per cent. of the mustard gas in such a solution is hydrolysed in three minutes, but this reaction is not accelerated by alkalis (Peters and Walker, 1923).

(*b*) The tears, except in the earliest stages of the burn, have no vesicant effect on the conjunctiva of rabbits (Warthin). (Bonnefon dissents from this, stating that tears are vesicant for two to five days.)

(*c*) If mustard gas is applied to skin covered by a paste of sodium bicarbonate and water the resultant burn is worse than if it is applied directly to the skin (Warthin).

Consideration of these facts suggests that if sodium bicarbonate solution has any effect on eye burns it is simply by virtue of the irrigant effect of the aqueous vehicle. Saturated boric acid acts in the same way, but has the disadvantage that it dissolves slowly and that solutions must be prepared in quantity in advance.

Hypertonic Withdrawal

Bonnefon has advocated the use of hypertonic solutions on the grounds that a freer flow of lymph is produced in the already oedematous conjunctiva, and that D.E.S. is withdrawn through the conjunctiva by the osmotic effect of the solution—as shown by the fact that the fluid in the eye-bath used for application becomes caustic after a few minutes. The solution suggested is 800 grammes of saturated sodium sulphate + 200 grammes of saturated sugar syrup. It is extremely difficult to accept this scientifically, as he quotes no statistics of clinical results and the scientific basis for his claims is incorrect. He states that a porcelain-like burn of the cornea occurs only in the horse and the rabbit because they have no lacrimal glands. This porcelain-like burn is recorded in the *Medical History of the Great War* in the 10 per cent. of severe cases in human beings, and the horse and the rabbit have lacrimal glands—the lacrimal bones are notched for the duct (E. A. Spaul, personal communication).

Bonnefon also suggests earlier in his paper that the tears remain caustic for a few days in any case. A hypertonic solution in the ordinary way would withdraw water only through the living semi-permeable membrane. It is possible, therefore, that his hypertonic solutions merely act in the same way as sodium bicarbonate—that is, as a mechanical irrigant. Nevertheless as he makes strong claims for the clinical results it would be interesting to analyse the washings of eyes burnt by D.E.S.—one group being irrigated with sodium bicarbonate and the other treated by hypertonic solutions. This might give us a clue as to the relative value of the two methods, since it is doubtful if the mere production of further oedema will do very much good. The induction of conjunctival oedema is, I think, disappearing as a treatment from the armoury of most ophthalmic surgeons these days.

Summary

The tolerance of the eye to certain reagents capable of neutralizing mustard gas under various conditions is discussed.

Animal research on the following lines is suggested: (1) The effect of the application of the reagents discussed above to eyes exposed to low concentrations of mustard gas. (2) The comparison of the washings of such eyes of the first few days for total chlorides, after treatment by (*a*) alkaline lavage; (*b*) hypertonic solutions, as suggested by Bonnefon.

The results thus obtained might indicate further clinical trial of some of these reagents in the event of gas warfare.

I am obliged for information from Professors Spaul and Challenger of Leeds University and Mr. B. Wood, senior dispenser of the General Infirmary at Leeds.

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A RAPID PRESUMPTIVE SEROLOGICAL TEST FOR WEIL'S DISEASE

BY

H. C. BROWN, C.I.E., M.B., D.T.M. & H.

(*From the Wellcome Bureau of Scientific Research, London*)

The macroscopic agglutination of bacterial suspensions in the presence of homologous sera on a slide, which is gently rocked to and fro about a longitudinal axis, has been known for more than thirty years as a rough-and-ready method for the determination of the nature of a bacterium. Garrow (1917) elaborated the procedure in the form of his clockwork agglutinometer. It is claimed that the readings are on the average within one dilution of that found by the full macroscopic method, but, as the Medical Research Council's Report No. 51 points out, this represents a possible 100 per cent. error, and concludes that the field of usefulness of this apparatus lies where rapid work is required under stress of circumstances. It is exactly under such stress that the test described below is intended for use.

In the first place brief reference must be made to the standard agglutination technique devised by Professor Schüffner. This consists in making varying dilutions of the patient's serum, to which are added equal volumes of a formolized suspension of leptospira: after incubation, droplets are examined microscopically by dark-field illumination with a 2/3-inch objective and a high eyepiece; no coverslip is used. I have personally for several years been in the habit of examining for agglutination after the mixture of leptospira and diluted serum has been allowed to interact overnight at room temperature; other observers incubate for varying periods at different temperatures.

From time to time a macroscopic technique has been advocated similar to that used when studying bacterial agglutination, the results being read either by the naked eye or with a hand lens. Pot (1936), in describing a macroscopic test for Weil's disease, advocated the use of an antigen grown in Korthof's medium and incubated at 52° C. for two hours, the results being read with a hand

lens against a black background. In discussing this technique Brown and Broom (1939) gave it as their opinion that the test was not so sensitive as the microscopical test and that certain sera of low titres, such as those met with about the sixth day of the disease, might be overlooked when employing the macroscopic test. Brown and Broom also pointed out that human strains of *Leptospira icterohaemorrhagiae* isolated in England showed considerable differences in their agglutinability when using Schüffner's technique.

These observers also drew attention to the occasional occurrence of false positive reactions met with in the case of certain sera; these would cause difficulty in reading the macroscopic test. It is interesting to note that on the rare occasions upon which this false agglutination has been encountered a temporary false Wassermann reaction has also occurred. Even taking this and variations of agglutinability of different strains into account, the following rapid presumptive test would seem to be a useful diagnostic aid.

Technique of the Test

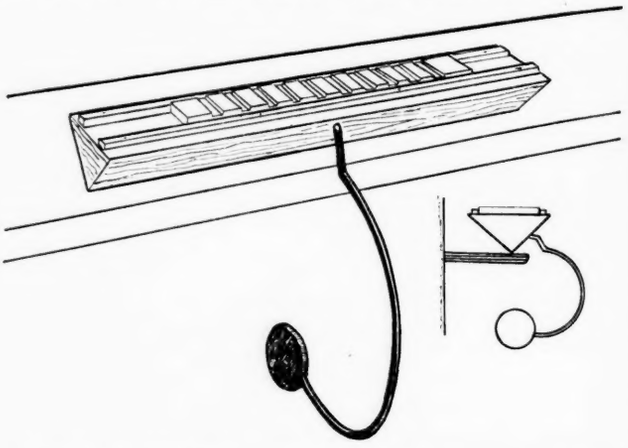
The test essentially consists in rocking to and fro on a slide for ten minutes small quantities of varying dilutions of the patient's serum in presence of a heavy suspension of *L. icterohaemorrhagiae*; this saline suspension is formolized to a concentration of 0.2 per cent. The preparation of a suitably concentrated antigen for this test is not a simple matter, as leptospira cannot be easily thrown down by means of a centrifuge from the fluid medium in which it is grown. Centrifuging a culture of leptospira in Fletcher's broth at 5,800 revolutions per minute for half an hour does not cause any obvious clearing of the supernatant fluid.

There are numerous references in the literature to spinning down leptospira from fluid media, but in my experience it is not a practical proposition unless some reagent is added which will facilitate the sedimentation of leptospira from the medium when it is centrifuged. This can conveniently be done by adding to the fluid medium saponin up to a total concentration of 1 in 1,000. The addition may be made after the culture has been formolized, which makes the procedure free from any risk of infection, although the strain, like the one employed, may have been subcultured at fortnightly intervals for five years and be no longer pathogenic.

Reference has already been made to the variation in agglutinability of various strains of leptospira which have been isolated from human cases during the last few years. Four human strains were compared as regards their agglutinability, both when put up in a water-bath for three hours at 56° C. and on the rocking slide. The same serum was used in each case. Both procedures gave exactly the same titres, but the titres varied according to the strain used. One strain was agglutinated up to 1 in 1,000, one only to 1 in 30, and the two other strains up to 1 in 100.

It is thus evident that the strain to be used as antigen in serological tests must be carefully chosen. The massed culture, about 500 c.cm., after the addition of formalin and saponin, is centrifuged at high speed and the deposit collected; this is suspended in saline until the opacity approximates that of a No. 1 Wellcome opacity tube used for the standardization of vaccines. The concentration required to get a suitable antigen from a well-grown culture for the rocking-slide method is approximately tenfold, so that 50 c.cm. of antigen can be obtained from half a litre of culture. This antigen is then centrifuged at approximately 3,000 revolutions per minute for ten minutes in order to get rid of any clumps of leptospira, and the supernatant fluid is bottled for future use.

The dilutions of the serum are made in the depressions of a painter's palette as in Schüffner's method. They are then mixed with an equal volume of antigen and placed on the slide shown in the diagram. This is made to rock for



ten minutes, and the result is read by means of a hand lens against a dark background. Numerous sera have been tested by this method, and by the macroscopic method after incubation for three hours in a water-bath at 56° C. The results have been compared with those obtained with Schüffner's technique, incubation having taken place at room temperature for approximately eighteen hours.

Results

The results of the rocking-slide method and the macroscopic have been consistently identical, but in every instance Schüffner's technique has given a titre three times higher than that obtained by either of the other methods. In order to test the sensitivity of the rocking-slide method two rabbits were immunized with 2 c.cm. of a broth culture of leptospira administered intravenously. Four days later the sera of these animals were tested by all three methods. The macroscopic and rocking-slide gave a titre of 1 in 10, whereas Schüffner's method gave 1 in 30. On the seventh day the two former readings were 1 in 100 and Schüffner's method 1 in 300, and on the tenth day 1 in 1,000 and 1 in 3,000 respectively.

It is claimed that the rocking-slide method, given a suitable antigen, will produce a result within fifteen minutes of the receipt of the serum, and that it is reliable enough to justify the administration of curative serum.

I should like to thank my assistant, Mr. R. J. Reed, for his skill and care in maintaining the cultures of leptospira.

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Histology of Mongolism.—Ten cases are described in which histological examination of the brain revealed widespread proliferation of the fibrous glia, which in several cases was not accompanied by corresponding changes in the myelin and in the cells. The pathogenesis of these changes is discussed, and it is suggested that the findings are not likely to represent the pathological substrate underlying mongolism. They do throw light, however, on the interpretation of certain previous findings.—Histological Changes in the Brain in Mongolism. A. Meyer and T. B. Jones.—*J. ment. Sci.*, March, 1939, **85**, 206.

EFFECT OF HEAT AND COLD ON HAEMORRHAGE

BY

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At the present time, when ambulance classes are being held all over the country, one feels that some notice ought to be taken of the effect of heat and cold on the control of haemorrhage. Although a surgeon or an obstetrician will try to control bleeding into a cavity by washing it out with a hot solution, it does not appear to be generally understood why this is done, and it is set out in the St. John Ambulance handbook that bleeding ought to be controlled by the application of cold.

By a series of experiments, performed as a preliminary to other work on blood-coagulation time, it was shown that heat shortened bleeding time but cold greatly prolonged it. It is known that the coagulation time of blood is affected by changes of temperature, but the duration of bleeding time appears to be altered more by the effect of temperature on the tissues than on the blood itself. In the two experiments illustrated below the first specimens of blood coagulated in approximately the same time whether the tissues were hot or cold. It is on the subsequent specimens, flowing through the same punctures, that the effect of temperature is seen.

In these experiments the blood was obtained through a small stab puncture above the terminal joint of a finger, a slight congestion being first produced. The rate at which the blood flowed could be controlled by altering this congestion. A bowl of water was used to warm or cool the hands, but the temperature of this was never excessive. The principle of the coagulometer used was that of Cannon and Mendenhall. Into a standard glass tube containing the blood a wire dips every half-minute until a clot forms. This limits the excursion of the wire. The instrument works automatically once the specimen is in position, and it allows the clotting time of ten specimens to be measured at the same period. When blood flows through a wound the subsequent specimens obtained have a gradually shortening clotting time. This shortening is considerable when the tissues are warm, but much less so when they are cold. It seems that a blood-coagulating substance is formed in increasing quantity by the tissues after a wound is made and that heat accelerates its production. If the rate of flow of a single blood specimen is increased less of the coagulant will be mixed with it, and we see that it has a longer clotting time than the specimens taken before and after it. A decrease in the rate of flow shortens the clotting time. It is to be noted that the rate of flow of first specimens taken from wounds does not affect the clotting time. Similarly, when tissues are cold and less of the coagulant is being formed, specimens are little affected by the rate of flow. The effect of heat and cold on bleeding time corresponds to that on clotting time. In the subjects used for these experiments the bleeding time was always greatly prolonged by the application of cold.

As bleeding is controlled by plugging the damaged vessels with blood clot, the aim of treatment ought to be directed to this end. Heat is obviously the means to attain this rather than cold, which merely narrows the vessels without accelerating the plugging process. It is noticed by many men, when it is pointed out to them, that they bleed from a shaving cut much longer on a cold winter day than on a warm summer day.

Experiment 52

HAND COLD		HAND WARM	
No. of Blood Specimen (*a*)	Clotting Time in Minutes	No. of Blood Specimen (*a*)	Clotting Time in Minutes
1	9½	1	8½
2	7½	2	5
3	5	3	5
4	4	4	1
5	3½	No further flow.	
6	4		
7	4½		
8	—		
9	4½		
10	4		
11	3½		
Blood continued flowing.			

Experiment 69

HAND COLD		HAND WARM	
No. of Blood Specimen (*a*)	Clotting Time in Minutes	No. of Blood Specimen (*a*)	Clotting Time in Minutes
1	7½	1	7½
2	6½	2	6½
3	8½	3	4½
4	7	4	2½ slow (*b*)
5	6½	5	4 quick (*b*)
6	7	6	3½ quick (*b*)
7	5½ quick (*b*)	No further flow.	
8	4½ quick (*b*)		
9	4½ slow (*b*)		
10	5½ quick (*b*)		
Blood continued to flow.			

Notes.—(*a*) Specimens were taken at 1-minute intervals and through the same puncture. (*b*) Denotes that the rate of flow was made quick or slow by altering the capillary congestion.

Summary

It is shown that heat accelerates the production of a blood-coagulating substance in damaged tissues and cold retards it.

It is suggested that heat and not cold ought to be used to control haemorrhage.

Clinical Memoranda

An Unusual Case of Facial Paralysis and a New Operation

Cases of facial paralysis due to various causes are fairly common, but such as I am about to describe I have never experienced before in civil or war practice. Before perusing the following description I would ask the reader to look into the nearest looking-glass, draw the right lower eyelid well down, push the tip of the nose over to the left, then screw up the facial muscles of the left side, and a very good idea of the case can be conceived. In May, 1939, the patient came into my hands, and the results obtained by my operation being considered satisfactory by all parties concerned I submit these brief notes.

Case.—A man aged 45 with right-sided facial paralysis; and the history was that forceps had been used at birth and in later life he had a motor accident. The lower right eyelid was everted, with epiphora and some discharge. The nose pointed to the left side, the right ala being collapsed. The mouth was drawn to the left side. When his face was not passive the patient grimaced hideously.

The Problem.—Obviously none of the classic operations such as nerve grafting or Gillies's temporal muscle transfer would be of any use even if the patient would have agreed to the time necessary for it. The everted lid and epiphora alone necessitated operative procedure. The nasal stenosis also caused distress; for the rest a cheery personality and congenial outdoor occupation led him to make light of his condition. After much thought I conceived the idea that if the facial tissues could be drawn across and firmly anchored the result should be satisfactory.

The Operation.—Excision two inches below pinna and behind angle of jaw; forceps entered at X and opened until the entire skin area represented by the dotted line on the diagrammatic sketch was separated from the tissues beneath, great care being taken not to injure any structures such as the duct. By keeping the finger within the buccal cavity Mr. Wilson safeguarded any penetration of the same. The whole skin tissues were then forcibly dragged over to X, a large semi-circular portion of tissue was excised (see wavy line), and under considerable tension the parts were brought together at X and secured between two parallel knitting needles. The eyelid condition was much improved by a common plastic practice—incision at AB and stitching in the opposite direction. The patient can now breathe through his right nostril. A further considerable improvement is due to the fact that the right angle of the mouth is now normal at rest and in action, in contradistinction to the very ugly effect due to the fact that in the course of years the orbicular muscle had contracted so much that the angle had disappeared and the orifice resembled a pear with stalk pointing to the left.

In due course I hope to be able to present to the Library of the British Medical Association enlarged photographs of the patient before and after operation. I have to thank Mr. H. C. Wilson, F.R.C.S., for entrusting me with the case, and for his valuable assistance during the operation.

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Formerly Plastic Surgeon, Queen's Hospital for Facial Injuries, Sidcup, and the Cambridge Hospital, Aldershot.

Two Cases of Grease-gun Finger

These two cases, which have been termed "grease-gun finger," are the result of an unusual industrial accident. The condition has been described by Smith (1939). In a number of garages and omnibus depots a high-pressure grease gun is used which delivers through a very small nozzle grease at a pressure of between 200 and 1,000 lb. per square inch. The grease is ejected by the pressing of a trigger attached to the gun. The accident usually occurs when the garage hand is wiping the nozzle of the grease gun, which comes into contact with a finger, generally the index finger of the other hand. The grease is forced through the pulp on the palmar aspect of the finger into the digit, and in a moment balloons the whole of it out and fills the tissues.

Interesting features are that the accident is entirely painless; the patient notices that the finger has suddenly become three or four times its normal size, and that there is a small puncture wound where the grease has entered. The patient usually says that the finger has gone numb. On examination the digit is dead white in colour and considerably swollen, the swelling extending down to the junction with the palm of the hand. It resembles superficially a very bad whitlow, but is quite cool and quite painless, and the patient can move the finger freely. It is usually impossible to express any grease out of the puncture wound, for it has been spread uniformly and diffused over the whole of the subcutaneous and other tissues of the finger.

From this point the history is a very chronic one. There is no discharge; the finger is treated as potentially septic, and by the third or fourth day the skin on the palmar aspect of the distal part has become black and gangrenous, but there is still very little indication of inflammatory change. About the tenth or twelfth day signs of sepsis are usually apparent, and it becomes necessary to incise and remove gangrenous skin. The course of the disease is apyrexial from beginning to end. Extension beyond the finger does not appear to occur. Suppuration is local, usually with profuse granulation tissue, and ultimately there is a discharge of a flake of bone from the palmar aspect of the distal phalanx. The average duration of the condition from the time of the accident to the time of healing is six months. There is very little residual incapacity, and the patient retains free movements of the fingers.

CASE I

A tecalemit operator aged 27 gave the history that on September 27, 1938, while working a high-pressure grease gun, he accidentally discharged the gun against the index finger of the left hand. He felt no pain, but noticed that the index finger became suddenly numb and swollen. He at once reported to the hospital, where all attempts to express any grease from the small puncture wound on the palmar aspect of the finger failed. He was put on expectant treatment, with rest, hot fomentations, and finally operative incision followed by baths. On February 20, 1939, a fair quantity of pus was discharging from the finger, and finally a small piece of sequestrum separated. On April 24 he was discharged as healed.

CASE II

At 6 p.m. on May 5, 1939, a man aged 36, whilst operating a high-pressure grease gun, using yellow grease the consistency of petroleum jelly, accidentally pulled the trigger while the nozzle was against the first finger of the left hand. He said he did not realize anything had happened until the finger went numb, and he then saw it was dead white in colour, slightly swollen, and full of grease down to the middle joint. He came to hospital within half an hour of the accident. On examination the finger was slightly swollen and yellowish white in colour down to the proximal interphalangeal joint. A small puncture mark was visible on the palmar surface of the finger about a quarter of an inch from the distal end. There was no pain. An incision about half an inch long was made through the puncture mark. Very little grease appeared, even on firm pressure. A small strip of rubber glove was inserted as a drain and antiphlogistine applied. The antiphlogistine was repeated daily. There was a very slight discharge for twenty-four hours, then no more, as the grease seemed to have penetrated every tissue, rendering the finger avascular. After the fourth day the finger became indurated and black down to the terminal interphalangeal joint. About May 14 the finger suddenly doubled its size, the skin on the plantar and dorsal surface being separated from the underlying tissues by a watery fluid down to the mid-interphalangeal joint. On May 15 the raised skin was removed under nitrous oxide anaesthesia, and on the 16th radiant heat was given. Recovery occurred slowly.

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C. J. ROOKE, M.B.,
House-surgeon, Hove General Hospital.

REFERENCE

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Listeners on Christmas Eve will hear the first national wireless appeal on behalf of all voluntary hospitals throughout Great Britain and Northern Ireland. The B.B.C. has determined on this combined hospitals appeal in place of separate appeals on behalf of individual hospitals, and the detailed arrangements are being made by a special committee representing the British Hospitals Association and King Edward's Hospital Fund for London. Combined effort has already proved successful. In the past three years London hospitals have nearly doubled their street collections by doing away with the seventy-seven different flag days formerly held throughout the Metropolitan Police District which have been co-ordinated in one united effort.

Reviews

RECENT WORK IN BIOCHEMISTRY

Annual Review of Biochemistry. Vol. III. Editor, James Murray Luck; Associate Editor, James H. C. Smith. (Pp. 676; 1 figure. 27s. 6d., postage extra.) California: Stanford University; London: H. K. Lewis. 1939.

Once again the *Annual Review of Biochemistry* presents us with its comprehensive survey of the results of recent research in that science. The task of the editors tends to become no less formidable in that each year finds the prosecution of biochemical investigation continuing with ever-increasing vigour, but they and the reviewers, no matter what their difficulties, always manage to achieve their main objectives. In this eighth edition the quality of the work may be rightly gauged by reference to the names of some of the contributors—Linderström-Lang on proteolytic enzymes, Freudenberg on polysaccharides, Astbury on *x*-ray studies, Laqueur on hormones, Landsteiner on immunochemistry, to mention only a few. The literature under review, while it does not show that there have been many discoveries of a revolutionary nature, does clearly indicate marked and continuous progress. Much has been achieved in the way of extension and elaboration of highly important work, the basic features of which have already been fairly well established. Such is typically the case in the great strides made possible by the use of isotopes in labelling elements for metabolic studies. So wide has this application become that it enters into a number of different sections in this volume, but is most fully and interestingly presented in the chapter devoted to mineral metabolism. In particular, the fundamental principles governing the application of induced radio-active isotopes are here discussed, and followed up with an examination of the results so far achieved by this technique.

In the vitamin field, among the more important researches referred to are those concerned with the means of differentiating between vitamins A_1 and A_2, the further elucidation of the exact nature of the constituents of the B_2 complex, and the progressive steps culminating in the chemical synthesis of E. Certain clinical observations are included in the summary of the work on vitamin K, and afford ample evidence that there is distinctly more than mere academic interest in this anti-haemorrhagic factor. Due reference is also made to numerous chemical methods for the quantitative determination of vitamins, and their use in studies of human nutrition. The enormous volume of the current literature on the hormones presents unusual difficulty to those whose task it is to survey it adequately within reasonable space limits. In this book Laqueur and his collaborators succeed in presenting the gist of no fewer than 540 publications, and that in a readable form which is in no sense a mere cataloguing of papers. The most widely studied are seen to be the various anterior-pituitary, the sex, and the adrenocortical hormones. Of the first group, the diabetogenic and glycotrophic factors have come specially into the foreground in recent times, while the work on the nature of the urinary steroids is shown to have significant bearing upon each of the other two groups.

The proteins as a class have been subjected to intensive investigations from widely different points of view. Their chemistry and metabolism are each afforded separate chapters, while the *x*-ray studies that are reported penetrate deeply into the problems of their fundamental structure. Applied to fibrous proteins these *x*-ray investigations indicate that they all fall into two main groups—the keratin-myosin group and the collagen group. Myosin, the chief muscle protein, shows a quite remarkable similarity to the labile or "supercontracting" form of hair protein. Original distinctions between fibrous and globular proteins have now almost disappeared; thus it is that, to quote the reviewer, "we arrive at a conception of unity, a unity amongst all proteins. They are difficult in details, but not in principles."

The biochemically minded will study this volume from cover to cover; others who do not wish to delve into the more abstruse subject-matter, but merely desire to see where the science is making its most direct impress upon clinical medicine, will find it scarcely less valuable.

VARICOSE VEINS OF THE LOWER LIMB

Varicose Veins. By Alton Ochsner, B.A., M.D., D.Sc., F.A.C.S., and Howard Mahorner, B.A., M.D., M.S., F.A.C.S. (Pp. 147; 50 figures; 2 coloured plates. 12s. 6d. net.) London: Henry Kimpton. 1939.

This monograph on varicosities of the veins of the lower limb is, with some additions, a reprint of a paper by the two authors which appeared in *Annals of Surgery* last year. Varicose veins elsewhere than in the lower limb are not dealt with, and some indication of this might perhaps have been given in the title, since seekers for information concerning varicocele, haemorrhoids, oesophageal varices, or those found elsewhere in the body will be disappointed if the general title leads to the expectation that references to these conditions will be found in the book. Dedicated to Rudolph Matas, this volume on the leg veins, however, is a worthy addition to the important contributions to vascular surgery which have already come from the New Orleans School headed by Professor Matas. The treatment of varicose veins in the legs has passed from an almost purely surgical phase through a period of enthusiastic injection treatment to the present stage, when it is generally realized that most cases are best treated by a combination of surgery and injection. The internal saphenous vein forms the longest subcutaneous venous system in the body, and most cases of varicose veins involve the vein itself or its tributaries. The authors draw attention to Sir Benjamin Brodie's description in 1846 of a test to show incompetency in the valves of the great saphenous vein, and it was not until forty-five years later, in 1891, that Trendelenburg described the same test which is now usually known after him. It is pleasing to notice this test described by Ochsner and Mahorner as the Brodie-Trendelenburg test, and Professor Matas in an introduction describes this as a legitimate though tardy bit of historical justice.

A historical introduction is followed by considerations of the pathology, physiology, aetiology, and clinical aspects, and leads on to a description of the examination of the patient and the methods of treatment of the various veins themselves and of varicose ulcers when present. Where the Brodie-Trendelenburg test is positive Trendelenburg's operation should be performed. The importance of high ligation and transection of the saphenous vein, and, should the superficial external pudic, external superficial femoral, and superficial circumflex iliac veins empty into the saphenous above the site of the ligation, ligation of these tributaries also, is stressed. After transection the distal part of the saphena magna is injected with sclerosing solution. This is a highly successful form of treatment if attention is paid to details; in the past many relapses have been due to failure to pay such attention.

This monograph is a really excellent account of varicose veins in the lower limb and may be profitably consulted by all who are called upon to treat sufferers from the condition.

THE CRIMINAL AND HIS SETTING

The Criminal in Society. A Review of the Fundamentals of Criminology. By Henry T. F. Rhodes. (Pp. 280; illustrated. 7s. 6d. net.) London: Lindsay Drummond. 1939.

The contribution which Mr. Henry Rhodes has here made to the popular understanding of crime is to give a clear and condensed summary of the attitudes towards crime and the theories of its nature which have been held through the ages and more particularly in recent times. Until quite recently, as the notorious Calas case showed, the person accused of crime was accorded no rights at all, and even now men cling tenaciously to the idea that crime is a theological vice. Mr. Rhodes traces the advance to the psychological view of crime, which he regards as the most immediately important. He recognizes, however, that while we cannot escape from the study of the psychological situation which finally determines the criminal act, we cannot neglect the contributory factors of environment and social order. Society must take part of the responsibility for the crime; deficiencies are to be found in both the contributing factors. He therefore surveys the social background at various times, dealing with society itself as a problem, and gives particular attention to the economic factor, the neglect of which has been responsible for many fantastic opinions. He deals with criminal sociology, criminal responsibility, and the origin and significance of punishment, inferring that mere reform of penal methods can never be the final end of penology, which is deprived of all meaning and utility if no account is taken of the environmental factors. He closes the book with an acute analysis of crime in the authoritarian States, the democratic countries, and the socialist system of Soviet Russia, giving some account of the extraordinary progress reported to have been made in the U.S.S.R. by the application of constructive methods of reform. A student who requires a sound introduction to criminology could do no better than read this book, with its wealth of citation and reference and its moderate expression of opinion.

OCULAR APHASIA

Ocular Dominance in Relation to Developmental Aphasia. By M. Macmeeken, M.A., B.Ed. With appendix by Robert Sampson, F.R.C.S.Ed. (Pp. 60; 12 figures and 8 tables. 2s. net.) London: University of London Press, Ltd. 1939.

A quite remarkable piece of work has been done by Mr. M. Macmeeken, under the auspices of the Ross Foundation, for the study of prevention of blindness in Edinburgh. Children are brought to eye specialists in the hope that some defect of vision might be discovered that would account for the child's inability, total or partial, to learn to read. In some of these cases no such defect is found; the child is sent back to the difficulties of his educational outlook. There the matter is allowed to rest. Too often low mental capacity is adduced as the only alternative explanation, when in fact a high level of intelligence may be present. These cases, and others known as congenital word-blindness, were investigated by the Foundation.

In all 392 children were investigated—194 boys and 198 girls. They came from a good-class primary school of 900 pupils. The fathers were mostly engaged in industrial work. In examining the nature of the difficulties involved it was found that the recognized contributory causes to poor reading, such as absences from school, poor eyesight, and poor hearing, may and do produce bad reading capacity. But it was found that these were not sufficient to produce inability of such severe degree as to involve *disability*. The residual and serious disability is held to be due to aphasic characters. These children are "developmental aphasics" showing in varying degrees and as major aspects of the condition the two aphasic syndromes of word-recognition difficulty and the tendency to reverse letters or to distort letters or syllables within words. A significant relation was found between disability and left-eyedness as determined by sighting or directional tests of "eyedness." Every one of these "disability children" was found to be left-eyed.

This is a most interesting piece of research and well worthy of study. There is also an appendix giving the results of an investigation by Dr. Robert Sampson into the binocular vision of a series of children with reading disability.

A LITERARY TRIBUTE TO BART'S

Rose Window: A Tribute offered to St. Bartholomew's Hospital by Twenty-five Authors. With a foreword by the Lord Horder, G.C.V.O., M.D., F.R.C.P. (Pp. 386. 7s. 6d. net.) London and Toronto: William Heinemann. 1939.

St. Bartholomew's Hospital has good reason to be deeply grateful for a *Rose Window* constructed by twenty-five writers all of established position, who have been generous enough to give freely this work of theirs for its rebuilding fund. In this galaxy Marjorie Bowen paints a story of wistful charm in delicate colours, Ann Bridge draws a character study in forceful lines, J. B. Priestley tells us of some mad companions, G. B. Stern contributes a scene of skilful domestic diplomacy, while Noel Coward displays his contempt for theatreland, and Sir Hugh Walpole brings in a note of macabre horror according to his wont. In an age which produces more poets than real poetry Humbert Wolfe, Edmund Blunden, Walter de la Mare, Day Lewis, and others here prove that the authentic note has not faded into silence. Anna Zinkeisen has embellished the book with sprightly illustrations. With one exception every work is new and hitherto unpublished. The contributors have been so good as to make over all their royalties and in some cases the world copyright to the hospital—a gift obviously of great potential value. Clearly a most appropriate Christmas gift both for the recipient and for a famous hospital.

DIETARY STUDY OF AN AFRICAN TRIBE

Land, Labour and Diet in Northern Rhodesia: An Economic Study of the Bemba Tribe. By Audrey I. Richards, M.A., Ph.D. (Pp. 423; Illustrated. 30s. net.) London: Oxford University Press. 1939.

In former times any investigation into the diet of a primitive people would have been undertaken with a view to demonstrating how much better the feeding of savages in a state of nature was than that of a sophisticated European. To-day the study of the dietary of a primitive tribe or population has largely for its aim the practical improvement of that dietary in order to preserve the health and improve the nutrition of that people. Owing to the more intimate and ubiquitous contact of native tribes in Africa and elsewhere opportunities for inquiring into their habits of feeding and the production and quality of their food, as unaffected by such contact, are rapidly disappearing, and the importance of studying and

recording facts in the field is now recognized by scientists and by Governments. Such a dietary study of the Bemba tribe has just been made by Dr. Audrey I. Richards, senior lecturer in social anthropology in the University of Witwatersrand, and published for the International Institute of African Languages and Cultures by the Oxford University Press. It is entitled *Land, Labour and Diet in Northern Rhodesia*, and it is an important book giving a careful and detailed account of the foodstuffs of the Bemba, the largest and most highly civilized tribe in Northern Rhodesia, the use the people put them to, their eating customs and prejudices, and their methods of growing, storing, and dividing food. It thus covers a wide field dealing not merely with dietary as such, but also with those economic, social, and magico-religious factors which arise in connexion with eating and drinking, and which, as the author remarks, "are social institutions in any country." The book is easy to read and is abundantly and appropriately illustrated. At the end are some useful maps and tables.

Notes on Books

Dr. F. M. B. ALLEN'S useful *Handbook of Diseases of Infants and Children for Students and Practitioners* has been extensively revised for a second edition (London: Baillière, Tindall and Cox; 18s.). It is one of the best books of its size on paediatrics, essentially practical in outlook and clear in expression. The important advances of the last few years are faithfully incorporated, including the use of the sulphonamide compounds. Experience as physician in charge of infants at the Belfast Royal Maternity Hospital has enabled the author to revise the sections on the premature and newborn infant, which are now of great value.

In *Wild Foods of Britain* (A. and C. Black, 2s. 6d.) Mr. JASON HILL places the wild foods of this country into three categories: first there are a few delicacies which are well worth collecting however liberally stocked the garden and the larder may be; secondly, those which become worth special attention when supplies happen to be curtailed; thirdly there are many homely flavourings which have been unfairly ousted by the grocer's products. Here familiar names appear as unfamiliar foods—lady's smock for sandwiches, pig nuts such as Caliban dug with his finger-nails, sow thistle and shepherd's purse, tansy and sweet cicely, who in spite of her attractive name was the least appreciated by the Hill family. We are assured by the author that despite our mistrust there is only one lethal fungus in this country, appropriately named the death cap, which can always be recognized by its white gills. It is admitted that not many of the wild vegetable foods have a high nutritive value—if they had they would not be wild—but most are very rich in vitamins. Practically all the foods and recipes have been tried by the author and family, but it is regretfully stated that no method was discovered of making the fresh-water mussel edible; bargemen are reported to have eaten it, but their observations could not be recorded. Indeed, we gather that Milton was right, and that the services of a "neat-handed Phyllis" are essential to make a savoury dinner of these "herbs and other country messes"; otherwise L'Allegro's anticipations may be followed by sensations more appropriate to Il Penseroso.

In his work on *Medical Climatology* Dr. CLARENCE A. MILLS, who is professor of experimental medicine in the University of Cincinnati, discusses, as the subtitle indicates, the effects of climatic and weather influences in health and disease. The subjects discussed include variations in fertility and sexual functions, world climates as they directly affect man, climate and disturbances of metabolism, infectious disease and body resistance, sclerosis and failure in the vascular system, mental function (suicide, homicide, mental instability and breakdown), dental caries, rheumatic fever and rheumatic heart disease, and tides in sickness and death rates. A bibliography of 119 references is appended. The work, which should form part of the library of every medical officer of health and epidemiologist, is published by Baillière, Tindall and Cox, price 25s.

Preparations and Appliances

CLOSED-CIRCUIT CO_2 ABSORPTION APPARATUS

Dr. H. PARRY-PRICE, senior anaesthetist, Royal Berkshire Hospital, writes:

It seems that economy in gas and oxygen is going to be necessary during present hostilities. With this object in view I have devised a simple closed-circuit CO_2 absorption apparatus which will fit on to all machines such as McKesson, Boyle, and Walton.

As will be seen in the diagram, the gases pass through entrance A into a CO_2 filter. The basal oxygen supply comes in at inlet A at whatever pressure desired and from whatever gas-and-oxygen apparatus is being used. This entrance is

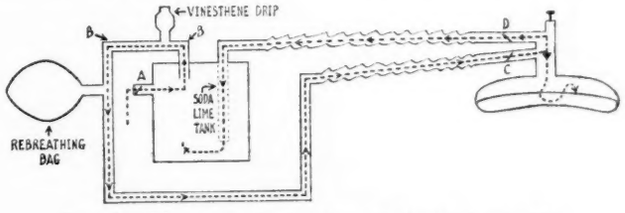

FIG. 1.—Diagrammatic drawing of closed-circuit CO_2 absorption apparatus.

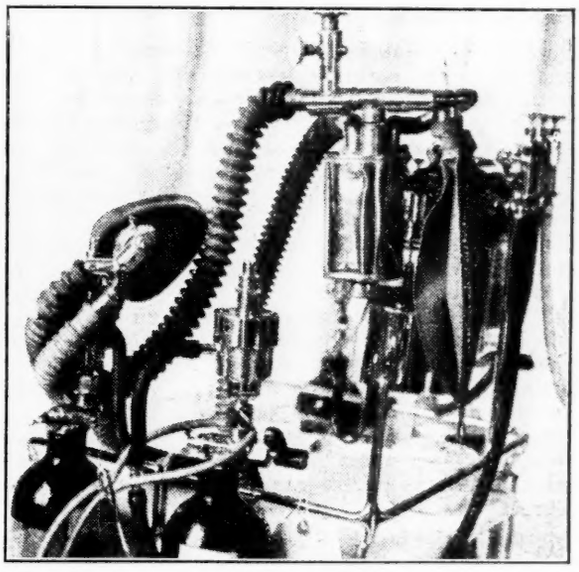

FIG. 2.—Apparatus attached to Boyle's machine, showing face-piece, inlet and outlet tubes, soda-lime tank, vinesthene drip-feed, and rebreathing bag.

guarded by a flap valve which prevents back-flow of gases during rebreathing. The collar A will jam on to the end of any apparatus—Boyle, McKesson, etc. The gases go out by pipe B, which has a McGill rebreathing bag on it, also a vinesthene drip-feed for deepening anaesthesia if required. They then pass by rubber tubing to the face-piece. At the face-piece there is an inlet guarded by a flap valve, C, and an exit guarded by flap valve D. There is an ordinary spring-guarded expiratory valve on top of the face-piece. Gases return along rubber tubing to the soda-lime tank and thus round the circuit again. The total cost of apparatus was just over £5. I have had it in use now for just over nine months with extraordinarily economical results.

Nova et Vetera

CAPTAIN COOK, HYGIENIST

The Life and Achievements of Captain James Cook, R.N., F.R.S., Explorer, Navigator, Surveyor and Physician. By Surgeon Rear-Admiral John Reid Muir, M.B., F.R.C.S.Ed. (Pp. 310; illustrated. 10s. 6d. net.) London and Glasgow: Blackie and Son. 1939.

At first sight another life of the great circumnavigator James Cook may seem redundant. Ever since his tragic death at Hawaii in 1779 accounts have been published of his adventures and discoveries, as well as several lives of the explorer. Most of the last were written by distinguished sailors or naval historians. The volume before us is also written by a sailor, a distinguished naval surgeon, and herein lies the interest and value of his new book about James Cook.

None of the previous authors, whether sailor or landsman, failed to dwell upon the important and original measures which Cook took to preserve the health of his crews. Before his time it was the ordinary thing, in a long voyage of a year or more, for at least half, but usually more, of the ship's company to die before the completion of the voyage from disease, chiefly scurvy, but also from typhus and other fevers. Cook brought about a remarkable change for the better. It is true that a few earlier sea captains had interested themselves in this matter, particularly Admiral Sir John Hawkins, in the reign of Queen Elizabeth. But apart from the very few, no commander appears to have bothered himself over this vital problem, but to have looked upon the decimation of his crew as something unavoidable and all in the natural course of maritime events.

Surgeon Rear-Admiral Muir in his most readable biography has laid special stress on this side of Cook's genius, and for that reason, no doubt, refers in his subtitle to his hero as Physician, as well as Explorer, Navigator, and Surveyor. Although James Cook is, and will always be, remembered as one of our greatest English sailors, he is almost the only one who did not achieve his greatness by bloodshed. He was an Empire-builder who added colonies to the Empire by means of persuasion and not by force. He was essentially a humane man, both to those who served under him and to the natives of the various islands which he discovered. Cook began life with none of the advantages one associates with those who eventually become distinguished men of science. The son of a farm labourer, he became a shop assistant, and then signed on as a deck-hand on board a Newcastle coal vessel, a hard school in which, as the author remarks, "if the conditions of existence were severe the experience was essential in the work of transforming the grocer's assistant into the famous explorer."

No doubt the bad health of sailors was in part due to the low standard of efficiency among the members of the medical profession who were employed at sea. Even if they were not ignorant or lazy, their social status was so inferior that their opinions, even if sound, were little likely to carry any weight with their commanding officers. Overcrowding was always a fruitful cause of the spread of disease, coupled with the complete lack of separate accommodation for the sick, which meant that infections and contagious diseases were bound to spread with appalling rapidity; and it was not until the early years of the nineteenth century that the elementary precaution of isolating the sick was approved and the modern sick bay established. The only serious efforts made to deal with scurvy before Cook's time were those of Dr. James Lind, physician to the Haslar Hospital, 1758–94, who discovered lemon-juice to be a specific, although by a tragic misnomer it came to be called lime-juice, a far inferior anti-scorbutic, and it is lime-juice which is still issued instead of lemon-juice in the Royal Navy.

This interesting book is illustrated by seventeen plates and has a useful chart.

PHILIP GOSSE.

JOHN HALL—SHAKESPEARE'S SON-IN-LAW

Many things, but not all, come to him who waits. For just over 300 years very little was known about John Hall, who married Susanna, the elder daughter of William Shakespeare, on June 5, 1607. It was known that she took after her father and that her husband was a skilful doctor who practised at Stratford-on-Avon and died there in 1635. He was well educated, had a sound knowledge of French, and was in some way connected with Acton, then a village six or seven miles from London. He was a Master of Arts of some university, and of his family nothing was known. The results of the search made by the Master of Jesus College, Cambridge—Mr. Arthur Gray—given in a little volume of twenty-two pages,[1] are most satisfactory and valuable. It now appears that he matriculated from Queens' College, Cambridge, in Michaelmas term, 1589, at the same time as his brother, Dive Hall, both being described as "of Bedfordshire." John Hall graduated B.A. in 1593–4, and took his M.A. in 1597. The father of the two sons was William Hall of Acton, Middlesex, gent., who made a will dated December 12, 1607. Mr. Gray gives a transcript of the will, which is a mine of information about the family. William Hall appears as a deeply religious Protestant with a rather disunited family. He seems to have practised medicine at Acton, perhaps as an extra-licentiate of the College of Physicians, and with such success that he had an assistant—called in the language of the day his servant. His leaning, therefore, was rather towards surgery, for a physician had no need for the services of an assistant. This assistant—Matthew Morris—may have been the Matthew Morris of Stratford-on-Avon who was a party to the transference of Shakespeare's house in Blackfriars to the use of Susanna Hall in 1618. The Hall family owned land near Harrold in Bedfordshire, so that Dive and John are properly described at their matriculation as of Bedfordshire, but their actual birthplace still remains to be discovered.

D'A. P.

AN OLD QUEBEC HOSPITAL

The issue of the *Revue des Deux Mondes* for August 1 contains an interesting account by Professor Emile Sergent of Paris of the Hôtel-Dieu de Québec, which recently celebrated the tercentenary of its foundation by the Duchess of Aiguillon, the niece of Cardinal Richelieu and patroness of Corneille. The noble lady arranged for the dispatch of some Ursuline Sisters from the Convent of St. Augustine in Dieppe to the recently founded French Colony of Quebec, where they succeeded in founding not only the Hôtel-Dieu but several other hospitals. At the present time the Hôtel-Dieu, which forms one of the principal centres for clinical instruction in Quebec, has more than seven thousand admissions a year, exclusive of the thousands of patients who throng its outpatient departments and dispensaries.

The "Penzance" medical manuscript, believed to be the oldest medical treatise written in England and ascribed to about A.D. 1250, which was described in the *British Medical Journal* of July 8 (p. 80), was sold by auction for £235, a distinctly moderate price in the circumstances. So far as is known it has not been acquired by any public institution or library. The two rare tracts, found together, described in the issue of July 29 (p. 242) were sold for £82.

[1] *Shakespeare's Son-in-Law, John Hall.* By Arthur Gray, M.A. Cambridge: W. Heffer and Sons. (2s. 6d.)

BRITISH MEDICAL JOURNAL

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A NATION IN GOOD HEALTH

Interesting and important as are the facts and figures presented in the Annual Report of the Chief Medical Officer of the Ministry of Health (reviewed in our last issue) its appearance makes us speculate rather on the story he will have to tell next year and the years after that. Will the downward tendency of the mortality and morbidity curves be reversed as a result of the war? Will the state of the public health reflect in increased sickness the state of the public mind, its anxieties and other emotional disturbances? Will it have to be recorded that the economy axe has fallen on this or that service, this or that control?

It is usual and understandable, but often fallacious, to go to the war of 1914–18 for parallels. If that can fairly be done in the field of public health the outlook is almost wholly encouraging. So far from public health having been retarded during the last war it took several leaps forward. The civilian death rate for the decade that included the war years was the lowest up to that time. Infant mortality fell markedly during the war—a rate of 108 per thousand births in 1913 had become 89 by 1919, and continued to decline, almost consistently year by year, to the present figure of 53. In 1917 the rate of maternal mortality was lower than it had been during the previous six years. Tuberculosis notably declined during the war. In 1913 the new cases of tuberculosis had numbered 117,000, but they never reached the six-figure level again, and in the first year after the war they were down to 77,000. Nor did the war interrupt the fall in incidence and lessening of virulence of various common infections. On the other side, the great influenza epidemic at the end of the war must be remembered. But on balance it would almost seem that a state of war—apart from its hideous toll of young male life—may have a hygienic value for a community. Or is it largely an illusion, and may the relatively low sickness level be explained by the fact that during war people do not so readily "give way" and in some respects live more hygienically?

On the other hand, the conditions of civil life were very different in the last war from what they are in the present. Twenty-five years ago war was not totalitarian. The possibility of occasional air raids on cities was a disagreeable anticipation (some people found it exhilarating) rather than a morbid obsession. Lights were dimmed, but there was no nightly "black-out" to endanger the traveller and lower the vitality of the whole community. Certain food shortages there were—people ate margarine instead of butter, saccharine instead of sugar, inferior bacon instead of butcher's meat—but these were not really felt until the war was more than half over. People as a whole were more busy, fewer had lost their jobs or failed to find others—and work which has to be done is a great prophylactic in times of public stress. Until the rise in prices, workers in civil life were for the most part better off than before; and income tax, slowly mounting from a small figure, never approached the catastrophic rate of 7s. 6d. in the £. There was no vast dislocation of hospital machinery and personnel with a partial paralysis of civilian medicine; and, above all, there was no large evacuation from cities. It is possible that organized civilian dispersal, which is only a precaution and not an act of war, may have effects more persistent for good or evil, or for both in different ways, than any direct action of the enemy, just as air raid precautions may number more casualties than air raids when damage to health and purse is reckoned in with damage to life and limb.

We must wait and see. For many of these effects we, or those who come after us, must wait for a very long time. It will be an interesting task for Sir Arthur MacNalty—we hope he will continue in office as long—to assess and chronicle the long-term reactions of a community like ours to a state of war. Meanwhile, the story he unfolds down to the very eve of war is so good that one feels anew the pity of it that the services should be interrupted or disorganized and that perhaps some territories where disease had been conquered should be retaken by that real enemy of mankind. Even the birth rate went up in 1938 to a figure which it had not reached for five years previously, and the death rate was lower than it had been for the last seven. The killing diseases mostly showed a lower incidence and a lower death rate. The one notable exception was cancer, which caused 1,665 deaths per million living in England and Wales. One interesting point is that while the crude rates imply that the mortality from cancer for each sex is increasing, the standardized rates—that is, with the differences solely due to the changed constitution of the population in regard to age and sex eliminated—show that the male death rate has steadily increased up to the present time, but the female rate since 1924 has been almost stationary with an irregular tendency to fall.

In his introduction to the report Sir Arthur MacNalty makes some philosophical reflections on progress. He points out that material progress, as exemplified by new inventions and economic prosperity, has always increased the difficulties of public health reform. To the superficial observer the industrial revolution of the early nineteenth century represented progress, with the

North of England studded with factories and national wealth increasing by leaps and bounds, but from the aspect of health it was not progress at all, and the clock of social welfare was put back. Progress is always two-edged. To-day the central nervous system is "dragged at the chariot wheels of modern progress." It is made to work, not necessarily more efficiently, but at a more rapid pace, and exposed to shocks and vicissitudes such as were never known in an earlier age. The penalty is nervous fatigue and breakdown. The mental health of the nation is of equal importance to its physical health. This Maginot Line is threatened, but we trust it will not be broken, by what is described as a "war of nerves." In any event it is reassuring to feel on the evidence of statistics, which here is indisputable, that this nation enters the war in much better health than it entered the last.

THE CONTROL OF PASTEURIZATION

The introduction by Kay and Graham in 1933 of the phosphatase test for controlling the efficiency of pasteurization constituted one of the most important steps of recent years towards the public health goal of providing the community with a safe milk supply. Already it has performed inestimable service, both in this country and on the other side of the Atlantic, where it has been adapted to the less stringent conditions of pasteurization in force in the United States and Canada. The original test has been modified considerably, and the effect of various factors on the result has been studied in some detail. The Imperial Bureau of Dairy Science, which was recently established at Shinfield, near Reading, could hardly, therefore, have chosen a better subject for its first technical communication[1] than the phosphatase test. The new monograph will be of particular value to chemists and technical workers who are called upon to use the test day by day. To the public health worker, however, it may prove a little disappointing by reason of its failure to answer one fundamental question—namely, What is the experimental error of the Kay-Graham test under practical conditions? Without this knowledge the exact interpretation of the result is impossible.

Milk is essentially a biological fluid, very complex in constitution, and never constant from one moment to the next. Every test, therefore, on milk is accompanied by an experimental error the magnitude of which varies greatly with the particular constituent under estimation. With regard to the phosphatase test, it is stated that the phosphatase activity of raw milk may vary considerably, depending to some extent on the stage of lactation, and that it is more closely associated with the fat than with the aqueous portion of the milk. It tends to be raised in milk coming from cows with mastitis. Experience has revealed the existence of differences in the buffer and in the Folin reagents used in different laboratories. The result of the test may be affected in addition by the use of carbolic soap on the hands or the glassware, by contamination of pipettes or of the milk with saliva, by the presence of tobacco smoke, by the use of bottle caps and stoppers containing phenolic resins or impurities, by the growth in the milk of phenol-producing bacteria or of bacteria capable of hydrolysing the substrate disodium phenyl phosphate, by the type of apparatus used for measuring the colour developed, and by sunlight on the bench. The test, moreover, requires great care in its performance and the possession of some technical skill. These are not objections to the test itself, which is undoubtedly an excellent one, but they must lead to the occurrence of an experimental error varying in size with different milks, different workers, and different laboratories. Until its range is known how is it possible to be certain that any colour exceeding 2.3 Lovibond units denotes imperfect pasteurization or contamination with raw milk?

There is a good deal of evidence already accumulated in the counties to suggest that many pasteurized milks are being unjustly condemned because a slightly greater depth of colour than the standard is obtained. When it is realized that the relation between the concentration of enzyme and of phenol liberated rises very steeply in the lower range of enzyme content, and that a difference of 0.5 Lovibond unit corresponds to a quite minute amount of residual phosphatase, it is surely important to know how often a difference of this degree can occur as the result of experimental error in titration. When it is further realized that the destruction of phosphatase in holder pasteurization occurs according to a monomolecular reaction, and that therefore the amount remaining after exposure to heat for a given time depends on the initial concentration present, there seems still further justification for wanting to know the nature of the frequency distribution of the results obtained under practical conditions. Would it not be possible to arrange for a comparative test to be carried out on an adequate number of milks between different workers (*a*) in the same laboratory and (*b*) in different laboratories? The recent international comparative trials of the Widal reaction brought to light surprising and unexpected differences between different laboratories in the accuracy of serum titration, and it seems not improbable that a similar trial, limited to this country alone, might well reveal more than minimal differences in the results of the phosphatase test. At any rate it is worth trying, and whatever the result the practical interpretation of the test will be placed on a much firmer footing.

[1] H. D. Kay, R. Aschaffenburg, and F. K. Neave (1939). "The Phosphatase Test for Control of Efficiency of Pasteurization." Imperial Bureau of Dairy Science, Shinfield, near Reading. Technical Communication No. 1. (2s.)

A BACTERICIDAL BACTERIAL EXTRACT

When so many workers are preoccupied with the study of chemotherapy by means of sulphonamide compounds it is interesting to find that substances which will kill bacteria are also being looked for in quite another direction. An effort demanding exceptional patience and optimism which has nevertheless had astonishing success is described in a series of papers by R. J. Dubos.[1] He started with the assumption that bacteria may exist which are capable of attacking Gram-positive cocci or some of their constituents, and employed in searching for them a method which has in fact already yielded micro-organisms capable of breaking down pneumococcal polysaccharide. A mixed sample of soil with certain mineral additions was maintained under suitable conditions of humidity and temperature until its decomposition was considered almost complete, and then fed for two years with suspensions of staphylococci, streptococci, and pneumococci. Since these bacteria furnished the only pabulum, only those soil organisms which could attack them would continue to proliferate, and presumably their capacity for doing so would be accentuated by adaptation during so long a period. At the end of it a sporing aerobic Gram-positive bacillus was isolated in culture from the soil which formed a substance capable of lysing staphylococci. This substance was liberated by the disintegration of the bacilli in ageing cultures, and could be obtained in a comparatively pure state by acidification, which precipitated it, and resolution in a neutral medium. Although earlier preparations so obtained contained a protein, further purification yielded a highly active extract which was protein-free. The properties of this substance are quite unexampled. It attacks not only staphylococci but all Gram-positive cocci which have so far been tested; on the other hand, it is entirely without action on Gram-negative bacteria. Pneumococci, which are most susceptible to its action, are killed in a short period by a concentration of 0.002 mg. per c.cm., and their growth is inhibited by the presence of less than one-hundredth of this amount. The lysis which results from its action is regarded as secondary, death having been caused by an action the nature of which is uncertain, although there is evidence of interference with the dehydrogenase system of the bacterial cell. Not only is this bactericidal action exerted *in vitro*, but the substance protects mice against large multiples of a minimum lethal dose of pneumococcus culture, even when its administration is postponed for several hours after infection. This is, of course, a much more remarkable property than any *in vitro* action, and at once stultifies any comparison with the action of violet dyes, to which there is some resemblance in the fact that only Gram-positive bacteria are attacked. It is not too much to say that these observations open a new field in the study of bacterial metabolism. It has long been known that some bacteria form substances more or less antagonistic to the growth of others—pyocyanin is the most familiar and best authenticated example—but the vigour, scope, and specificity of the effect demonstrated by Dubos are something entirely new. It may well be that susceptibility to the products of other bacteria is confined to a few pathogenic species, fastidious in their growth requirements; on the other hand, who knows what further strange phenomena may be brought to light by patience and a few pots of soil?

[1] *J. exp. Med.*, 1939, **70**, 1, 11, 249.

CONSERVATIVE TREATMENT OF THE ENLARGED TONSIL

The indications for tonsillectomy are fewer now than when the doctrine of focal sepsis was more widely held, and recognition that the enlarged tonsil is not necessarily an infected one has also encouraged a more conservative attitude. There is still uncertainty, however, about the local measures to be adopted in conservative treatment, and reports on the value of *x*-ray therapy have been particularly conflicting. In a recent review of the literature[1] thirteen authors are cited who claim satisfactory results from *x*-ray treatment, among them Hickey, who claims to have sterilized 80 per cent. of diphtheria carriers by *x* rays. The conclusions of a further group of seven authors are entirely unfavourable. They find that the tonsillar infection is not influenced by *x*-ray treatment, and that cicatrization of the tonsil causes pus to become locked up in the crypts, while atrophy of the soft palate and lesions of the salivary, thyroid, and even the pituitary glands have apparently been observed as later sequels. Such lesions are, of course, the result of defective or too enthusiastic *x*-ray technique, but the objection that shrinkage of the tonsil does not often lead to resolution of the inflammation would be generally upheld. Opinion would thus favour the middle course of the eleven authors who restrict *x*-ray treatment to simple hypertrophy of the tonsils and uncomplicated tonsillitis. Stojakowski and Radzyminski consider that tonsillectomy is indicated when there is pus formation in the tonsil and when there are systemic effects such as arthritis, toxic myocarditis, etc., *x*-ray therapy being tried in such cases only if the general condition of the patient renders a surgical operation inadvisable. They are on more debatable ground when they state that a favourable result in these cases is due to the slight destructive effect of the rays producing an intense reaction in which the neutrophils, reticulo-endothelial phagocytes, and lymph-germ centres are all stimulated, so inciting the body to "autotherapy." The chief indication for *x*-ray therapy is undoubtedly the simple hypertrophy of Waldeyer's ring in young children, where the signs are those of mechanical obstruction in the nasopharynx. Destruction of lymphocytes and thrombosis of small blood vessels result in rapid and marked decrease in size of the tonsils and adenoids comparable to the effects of *x* rays on the thymic hypertrophy of infants. The authors do not discuss technique or dosage, although it is variations in these just as much as the wrong selection of cases which have resulted in so many contradictory reports on the value of *x* rays. A dose of 25 to 50 *r* at weekly intervals for four to six weeks should seldom be exceeded, and such a course may be repeated several times at six-monthly intervals with complete safety.

[1] *Rev. Laryng.*, 1939, **60**, 369.

NOMENCLATURE OF SKIN DISEASE

The last International Congress of Dermatologists was held at Budapest in 1935 under the presidency of Professor Nekam, another is due at New York in 1940. Let us hope that the international storms with which we are now contending will clear away in time to permit it to assemble according to plan. As the principal object of the last congress Professor Nekam proposed a very definite task. It was nothing less than the standardization of the definitions and terminology employed by dermatologists all over the world. Although progress has been made in this direction by successive generations since Willan over a hundred years ago first put forward and defined the primary lesions of diseases of the skin, real uniformity is still unattained. Consequently with the help of no fewer than 568 collaborators of every nation and clime he has produced the *Corpus Iconum Morborum Cutaneorum* in three volumes[1] for the purpose of standardizing the nomenclature of dermatology. This work consists of three volumes, two of which consist of illustrations of all the manifestations of cutaneous disease known, while there is an initial introductory volume, the greater portion of which consists of descriptions of the plates; but there is also a most important section devoted to the terms employed and to classification. Professor Nekam postulates that all diseases should be defined in Latin in order to avoid ambiguity, and he provides translation of those Latin terms which, certainly not commonly used, may be employed in this work perhaps for the first time, into the four languages employed at international congresses —German, English, French, and Italian. The translation is undoubtedly necessary, for many of these words have been coined for this special purpose and will not be found in the Latin dictionary. It is possible to find fault with some of the English equivalents given. For example, the word "cladiosus" is translated as "branchy"; "branching" would certainly be better, and "short-stalky" might well be altered into "short-stalked." These mistakes are, however, unimportant. There is no doubt much to be said for the principle that the official nomenclature of all diseases should be in Latin terms and that all the Latin terms used should be listed and translated so that no ambiguity may be possible in their employment. Moreover, there is no department of medicine where it is so easy to get confusion as in dermatology, owing to the vast variety of conditions with which it deals. Professor Nekam has given to his specialty a most useful work of reference which, if properly used, will do much to avoid misunderstanding between dermatologists, especially among those who describe the rarer conditions. It will, however, do nothing to remove the popular reproach that dermatologists are inordinately fond of long names. Here is a good example: Histiocytoma xanthelasmaticum! The defence of course is that such names are really descriptive and, if trouble is taken to translate them, give a pretty clear idea of the nature of the disease or condition. On the other hand, if clarity be desirable, which it is, there is nothing to be said for the practice of calling a disease after the man (or woman) who first described it, even though the merit so acquired deserves to be remembered.

[1] *Corpus Iconum Morborum Cutaneorum*. By L. Nekam, M.D., with the help of 568 collaborators. Parts I, II, and III. Leipzig: J. A. Barth.

MUSCLE FLAPS IN VASCULAR SURGERY

Bleeding from a tumour bed in the brain or a wounded venous sinus may be arrested by applying a "postage stamp" consisting of a piece of muscle, usually part of the temporalis or one of the thigh muscles. It was Horsley[1] who in 1914 first drew attention to the rapid haemostatic effect of detached muscle fragments applied to cut surfaces, and he compared the thrombokinetic action of the muscle with an observation made by Wooldridge[2] in 1893 that the addition of tissue juices to blood accelerated its coagulation. T. de Martel of Paris in his neurosurgical work has employed pieces of pectoral muscle from recently killed pigeons in the belief that the muscle of birds is more effective than human muscle. A freely bleeding laceration in the liver has been effectively controlled by the insertion of a large piece of the rectus abdominis into its depths. Experimental work on pedicled muscle flaps wrapped around wounded arteries is reported by R. M. Isenberger and M. C. Carroll of Kansas City.[3] Incisions were made into either the femoral or carotid arteries of dogs, and it is stated that the procedure of using a still attached muscle flap is not difficult and results in immediate haemostasis, permanent healing, and the preservation of the normal patency of the vessel. Tissue juices exude from the raw muscle and within a few minutes precipitate fibrin along the plane of contact between the living muscle and the wall of the injured artery. Steady but gentle application by digital pressure is made between the freshly denuded muscle and the lacerated artery for from one to ten minutes, or the muscle flap is sutured in position around the artery, no sutures traversing the vessel itself. Subsequent examination of the wall of the vessel which remains patent shows that a layer of endothelial cells covers the muscle in relation to the rent in the artery. In any type of surgical repair of wounded blood vessels the most important consideration is perhaps the development of an occluding thrombosis, and Isenberger and Carroll's experiments suggest that thrombosis is more likely to follow the application of a detached than of a pedicled muscle flap which is still living. They conclude that living muscle tissue is well adapted mechanically as a plastic tampon for immediate haemostasis; thrombokinase is liberated from the raw muscle and sets in motion the train of clotting reactions by which fibrin is deposited on the opposing surfaces and so effectively seals them. They suggest that these pedicled muscle flaps may be employed apart from vascular surgery for the repair of a wounded common bile-duct or to reinforce a line of intestinal anastomosis. But these extensions of the work are of limited value in view of the fact that other

[1] *British Medical Journal*, 1914, **2**, 8.
[2] *On the Chemistry of the Blood and Other Scientific Papers*. London, 1893.
[3] *Surgery*, 1939, **6**, 265.

and effective methods are available. In the field of vascular surgery, however, the pedicled muscle flap may have a future.

ENDOCRINOLOGY IN THE BEEHIVE

It is now known that the mammalian pituitary gland contains and secretes a principle which stimulates the sex glands to both increased growth and enhanced activity. Apart from this gonadotrophic principle of the pituitary gland itself, several other hormones having similar properties are now recognized and are finding a useful place in practical therapeutics. Of these, one is present in considerable amount in the serum of mares at one stage of pregnancy; another, with somewhat different properties, is abundant in the urine of pregnant women; and a third is found in the urine of women after the menopause. These gonadotrophic principles are mammalian in origin, and it is of interest, therefore, that evidence has recently been obtained of a gonadotrophic hormone from a different source—the bee. It is well known among bee-keepers that all new-born bee larvae receive during the first two or three days of life a special food known as royal jelly. But only those larvae which are destined to become queens continue to receive this food throughout the whole of their larval life. On this diet the larva grows rapidly to maturity, attaining twice the size of the adult worker bee but in a shorter time, and develops large ovaries and mature sex organs capable of laying eggs for several years. The worker bee, on the other hand, deprived of the continued benefit of royal jelly and fed on nectar and pollen, emerges from the larval stage with infantile sex organs incapable of function. That this development of a queen is solely due to a royal jelly diet and not to any constitutional cause would seem to be well established by an experiment, first recorded in 1791 and since abundantly confirmed, in which worker larvae substituted for the normal inhabitants of queen cells received the royal jelly intended for their predecessors and emerged as a result as full-size queen bees.[1] It was concluded by apiculturists that the jelly itself must contain some principle stimulating development of the sex organs. Definite evidence that this is so has recently been obtained by Heyl.[2] Samples of royal jelly were extracted by the same methods which are known to provide active extracts of mammalian pituitaries. The extracts were tested by the usual methods for detecting and measuring gonadotrophic activity, being injected into immature rats, in which they produced a definite increase in ovary weight of 60 per cent. over controls, the enlarged ovaries showing microscopical evidence of strong follicular stimulation. Thus an extract derived from a secretion of the bee was shown to have gonad-stimulating properties similar to those of mammalian hormones. The royal jelly is produced in a special gland in the head of the bee, the supramaxillary gland, which opens in the region of the mouth and yields the jelly as an external secretion. Heyl rightly calls attention to the similarity in position of this gland to the Rathke pouch from which the mammalian pituitary develops.

[1] *Bee-keeping*, 1937, **2**, 1635.
[2] *Science*, 1939, **89**, 540.

RESIDUAL INFECTIVITY OF THE PRIMARY COMPLEX OF TUBERCULOSIS

The persistence of living tubercle bacilli in the so-called healed primary tuberculous foci in the lung and hilar glands is of more than academic interest. Their presence is a constant menace to the body and may serve to explain the endogenous theory of the origin of pulmonary tuberculosis. In a review of the literature William H. Feldman and Archie H. Baggenstoss[1] conclude that there is no unanimity of opinion on the infectivity of chronic lesions of the primary complex of tuberculosis. They point out, however, that morphological evidence is not a trustworthy criterion unless the findings are supplemented by animal inoculation tests, and that even then there might be difficulty in correlating the pathological changes as viewed microscopically with the results of the virulence tests, since the same tissue cannot be used for both procedures. The authors' own investigation included examination of material from sixty-eight subjects, varying in age from 7 to 90 years (70 per cent. being in the fourth, fifth, and sixth decades of life), who had died from conditions other than tuberculosis. The tissues from the primary tuberculous lesions in these subjects were examined microscopically and, after emulsification, inoculated on to culture media and injected into guinea-pigs. In only one case were tubercle bacilli demonstrated by these methods, although microscopically the lesions (encapsulated and sclerotic, or caseous or caseo-calcareous) often showed evidence of activity. As the presence of silica in varying amounts was a fairly constant finding in the lesions, the authors suggest that in the absence of demonstrable viable tubercle bacilli in the lesions the histological signs of activity were possibly due to the silica. Their data suggest to them that in adults endogenous reinfection is unlikely to occur from lesions of the primary complex. It must be added here that such a conclusion, even if confirmed, does not invalidate the endogenous theory of pulmonary tuberculosis, as there is ample evidence that it often originates from the healed or latent pulmonary lesions developed during the stage of dissemination following the primary infection.

THE MEDICAL DIRECTORY, 1940

Messrs. J. and A. Churchill Ltd. have produced the ninety-sixth edition of their *Medical Directory* at the usual date and in the workmanlike manner to which we have so long been accustomed. Indeed there are some typographical improvements—as in the bolder printing of the names of streets in the Local List for London. There has been a net increase of 1,738 entries, but the number of pages of text has only increased by twelve. The numerical summary of the medical profession shows that there are now 62,847 names, compared with 61,109 for 1939. Increases will be found in all sections of the *Directory*: 636 under Provinces, 307 under Abroad, 245 under Scotland, 184 under London, 159 under Services, 152 under Ireland, and 55 under Wales. The price of the 1940 edition is unchanged at 42s.

[1] *Amer. J. Path.*, 1938, **14**, 473.

SURGICAL PROCEDURES IN GENERAL PRACTICE

This is one of a series of articles contributed by invitation

INJURIES OF THE SEMILUNAR CARTILAGES—II

BY

A. G. TIMBRELL FISHER, *M.C.*, F.R.C.S.

(*Concluded from p.* 1151)

Treatment of Recurrent Cases

Repair in cases of injury to the semilunar cartilages is very sluggish, and as blood vessels can only be traced in the region of the peripheral border it is probable that true repair is largely confined to minor peripheral fractures of the menisci. This is the probable explanation of the frequency with which the original injury is followed by recurrent symptoms. The latter are well known and need not be recapitulated in detail. At first the recurrent attacks are often associated with considerable reaction, but as a rule the attacks of locking, although possibly becoming more frequent, are associated with a diminishing degree of reaction and inconvenience. There is, however, a serious risk of the onset of arthritic changes, and the patient should always be warned of this danger.

Treatment of Recurrent Cases by Operation

Often operation is delayed for many years because of the slight inconvenience, and eventually the patient seeks advice owing to the fact that the recurrent attacks are associated with increased disability. The ideal time for operation has, needless to say, then passed, although such operation may be worth while. Early operation in recurrent cases should be strongly urged, and removal of the offending cartilage is the best insurance against the onset of arthritis. Provided arthritic changes have not supervened, the operation in skilled and experienced hands has become in modern times one of the most successful in the whole realm of surgery. Opinions differ as to how much of the damaged semilunar cartilage should be removed, and in any case this must depend upon the actual nature of the injury.* When there is any doubt, I believe that the wisest plan is to remove the whole cartilage by some such operation as my combined method (Figs. 5 and 6). This does not necessitate a large operative exposure, and permits actual inspection of the back part of the cartilage, instead of blind and unsurgical groping through an exposure anterior to the corresponding lateral ligament.

The anterior end of the semilunar cartilage is first exposed by means of a curved incision through skin and capsule anterior to the corresponding lateral ligament, and sometimes this exposure is sufficient. If exposure of the back part of the cartilage is considered necessary, all that is required is to prolong the anterior skin incision backwards and upwards, thus making a small flap with its convexity downwards. This flap is reflected upwards and the back part of the semilunar cartilage exposed by a second capsular incision posterior to the corresponding lateral ligament. It is sometimes argued that it is unnecessary to expose the back part of the cartilage because, if it is injured, it springs forward with traction upon the anterior portion of the semilunar and can be readily removed through the anterior incision. It is certainly true that this sometimes happens; but since adopting the

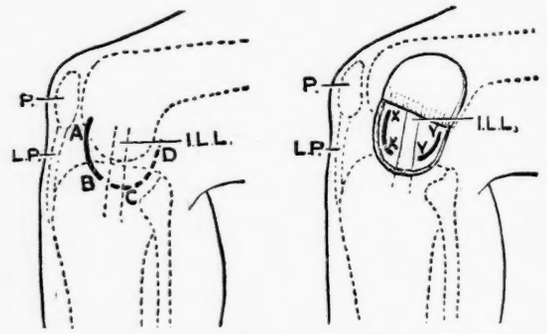

FIG. 5.—Diagram showing my method of exposure of the semilunar cartilage. P. = Patella. L.P. = Patellar ligament. I.L.L. = internal lateral ligament.

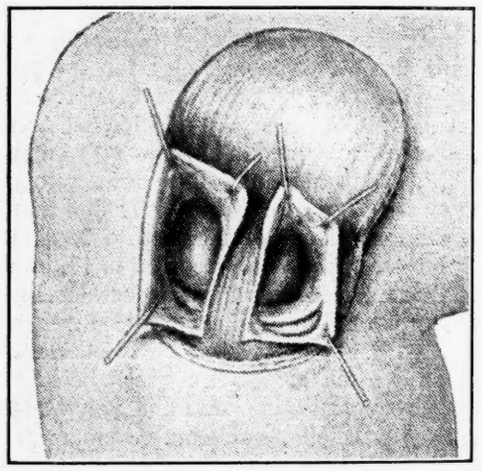

FIG. 6.—My method of exposure of the semilunar cartilage.

above technique I have been impressed by the number of cases in which exposure of the posterior part of the semilunar cartilage has revealed a severe lesion which it has not been possible to remove through an antero-lateral incision.

A word of caution is necessary against the practice of removing only the displaced handle of a bucket-handle lesion of the cartilage. In discussing the aetiology of this lesion it has been pointed out that the whole cartilage is detached, ground between the femoral and tibial condyles, and longitudinally split. The attachments of the peripheral portion must therefore have been severely damaged, and in my experience it frequently gives rise to subsequent trouble. There is no evidence that removal of the peripheral part of the bucket-handle lesion has any effect upon the stability of the joint.

It may be argued that such highly technical operative points do not concern the general practitioner. This is, however, not the case, for some of the blame for an

* This question is discussed in greater detail in my book *Internal Derangements of the Knee-joint*. 2nd edition. H. K. Lewis and Co., Ltd.

unsuccessful operation is apt to fall upon his devoted head, and any suggested operation should be fully and freely discussed between specialist and practitioner.

Operation in Complicated Cases

In some cases a lesion of a semilunar cartilage is associated with injury to the tibial spine, with the presence of one or more loose bodies, or with osteo-arthritic changes, and an extensive exposure of the whole of the anterior compartment of the knee-joint is desirable. In such cases my patella-displacing operation, in which the joint is opened by a long paramedian incision and the patella displaced towards the outer side of the joint, gives a complete exposure. I have never observed any interference with function that could be traced to this more extensive exposure.

Prognosis after Removal of Semilunar Cartilage

The prognosis, assuming a correct diagnosis and a satisfactory type of operation by an experienced surgeon, depends upon two principal factors: (*a*) the number and severity of the attacks; (*b*) the presence or absence of arthritic changes. With regard to the former, repeated attacks of locking or giving way of the joint followed by effusion lead in time to a certain amount of stretching of the joint ligaments and joint instability. In such cases operation may be of great benefit in curing the attacks of locking, but a certain amount of joint effusion after exercise, with a feeling of weakness and insecurity, may persist for awhile. This fact obviously constitutes an argument for early operation in recurrent cases. With respect to the second of these factors, although arthritis of the osteo-arthritic type is more apt to occur in neglected cases in middle life, it may occur in the knee-joint at a comparatively early age when operation is unduly delayed. In such, operation will probably cure the attacks of locking and may call a halt to the arthritic process, but it is obvious that it can have little effect upon the changes already present. This fact also shows the importance of early operation when recurrence of symptoms has become established.

If cases in which arthritis has supervened are excluded the results of operative removal in modern times by those with special experience are extremely satisfactory, and the progress that has taken place in recent years is shown by the following table:

	1911 Figures* per cent.	1932 Figures (my own) per cent.
No recurrence of attacks	82.02	100.00
Knee as good as the other	56.17	91.80
Movements perfect	86.51	98.36
No change in shape	76.40	83.60
Knee painless	48.31	81.96

* Power, D'Arcy (1911). *British Medical Journal*, **1**, 61.

My figures include a few cases in which both semilunar cartilages were removed from the affected knee; the results of such treatment are also good. One patient, a professional footballer, from whose left knee I removed the external semilunar cartilage in 1926 and the internal semilunar in 1927, is still playing a good game.

Treatment of Recurrent Cases by Mechanical Methods

It will probably be generally conceded that the various knee-trusses and other forms of apparatus sometimes worn in an attempt to prevent attacks of locking are, as a rule, inefficient and unreliable. The results of removal of the offending cartilage by operation in experienced hands are so satisfactory that the only conditions that justify the attempt to control recurrent attacks by apparatus are those cases in which operation is contraindicated on account of age or illness.

Manipulation in Recurrent Semilunar Cartilage Lesions

A well-known bone-setter used to claim that he could bring about "the radical cure of derangements of knee cartilages without operation." What is the truth about this matter concerning which controversy has raged for so many years? It is probable that many of these "cures" were of minor injuries of the menisci which had become tethered by adhesions, and manipulation in such cases is now known to be of proved value. It is clear from physiological reasons that actual cure by repair of the torn fragments in recurrent cases is probably impossible. The fractured surfaces become covered with smooth fibrous tissue, and even if apposition between the fragments could be obtained by manipulation it would be difficult to imagine conditions less favourable to repair. It must be conceded that in some recurrent cases associated with definite locking a temporary relief from symptoms has been obtained by manipulation. In my opinion such relief is due to the fact that either the fractured portion has been freed from adhesions tethering it in some abnormal situation, or the handle of a bucket-handle lesion has been firmly forced into the centre of the joint, where it has been temporarily out of harm's way and has become fixed by adhesions. Experience teaches, however, that the "cure" is rarely lasting, and when strenuous conditions must be faced such treatment by manipulation is usually a poor substitute for operative removal. It may be tried, however, when operation is refused or is inadvisable, and when there is no likelihood of subsequent strenuous use of the limb.

MINOR INJURIES IN CIVIL BOMBARDMENT

DR. TRUETA'S ADDRESS

The City Division of the British Medical Association called a meeting on December 5, which was open to all practitioners, to hear an address by Dr. J. Trueta of Barcelona on "Medical and Surgical Assistance of Minor Injuries in Bombarded Towns." The Great Hall of the Association House was entirely filled. The chairman, Dr. C. O. S. Brooke, said that in previous discourses before the Royal Society of Medicine, notably the one published in the *British Medical Journal* of December 2 (p. 1073), Dr. Trueta had dealt with the more serious injuries. His purpose on this occasion was to deal chiefly with minor injuries and their differentiation from the more serious.

Dr. TRUETA began by pointing out one respect in which the treatment of casualties due to bombardment of towns had an advantage over the treatment of the injured in ordinary military operations. Surgeons could not operate in the front line of battle; casualties had to be evacuated to the rear, some of them perhaps a considerable distance behind the lines. In the case of bombarded towns, however, the injured could be treated on the same principles as those hurt in road accidents—that is to say, any operative procedure could be undertaken almost at once on removal to the nearest hospital.

Many injuries in every air raid were caused by small splinters from the explosion of light bombs. The distribution of such splinters was horizontal, so that a large number of wounds were received in the leg and lower abdomen. Often the deeper

injury was far more extensive than the slight wound of the skin would lead one to suppose, and this was apt to mislead the surgeon.

After his own tragic experience in Barcelona, where he went through more than 340 bombardments, he was strongly of opinion that in all seriously wounded cases the immediate intervention of the surgeon was the only form of first aid desirable other than the possible application of a tourniquet to a limb which bled excessively. The application of splints or bandages or other forms of first aid had been shown to be generally not only useless but harmful in that it delayed surgical treatment.

First Aid for Casualties

Treatment could be administered in three places—in the ambulance, at the first-aid post, and in hospital. The only cases which needed immediate first-aid treatment as a result of aerial bombardment were wounds of the limbs with severe haemorrhage and fracture cases. All other casualties should be sent to the hospital direct without any first-aid treatment. With regard to wounds of limbs with severe haemorrhage, in every ambulance the attendant or nurse should be able to recognize those cases which needed the immediate application of a tourniquet. Haemorrhage, venous or arterial, or both, occurred in all extensive wounds, but only in certain cases was a tourniquet necessary or desirable. If there was a continuous and abundant flow of bright red blood—usually though not always in spurts—and a rapid and feeble pulse the tourniquet should be applied immediately. If, on the other hand, the flow was not great or if the blood was dark in colour a tourniquet should not be applied; such a haemorrhage could be controlled by direct pressure. Venous haemorrhage was sometimes increased by the application of a tourniquet. The tourniquet, if used at all, should not be left in position for more than the shortest possible time, never exceeding one hour for the lower extremity.

Fractures

The majority of fracture cases did not require the application of splints for transport to hospital. Sufficient immobilization was secured by placing the patient in a good position on the stretcher and supporting the injured limb by sandbags. Where there was extensive damage to the soft tissues and severe shock, however, splints might be applied, preferably the Thomas splint.

No stretcher case should be admitted to the aid post but should go straight to hospital. Walking cases could be divided into those suffering from actual wounds but able to walk to the post, and those not actually wounded but suffering from shock. Wounded cases needed immediate and careful examination of the whole area involved. Patients wounded in the thorax and abdomen and those with penetrating wounds of the limbs must go immediately to the hospital, as must the majority of cases of lacerating wounds or severely contused tissues. Only superficial wounds should be treated at the first-aid post, where the wound should be washed thoroughly with soap and water, followed by the application of a dressing of sterile absorbent gauze. Anti-tetanic serum should be given to all wounded cases. Tetanus was a common infection, at all events in Spain, and he had seen cases of tetanus produced after superficial wounds caused by glass.

Many of the victims who had no actual wounds but were suffering from the effects of explosion could be reassured after examination and sent home. For other cases in which there was gross excitement morphine was the best sedative. An injection of lobeline should be given to patients suffering from respiratory distress after "blast." When despite all treatment there remained a feeble pulse and severe depression the case should be sent to hospital as there was a possibility of internal haemorrhage. The true service of the aid post was to help and reassure nervous people, people suffering from psychological shock, and people who had sustained falls without actual penetrating wounds. All other cases should be sent immediately to hospital.

All hospitals serving an area liable to bombardment should have two types of operating theatres—one for major operations under general anaesthesia, and the other for minor operations. Closed fractures were the only cases in which it was absolutely necessary to take an *x*-ray picture before reduction and treatment. With the pressure of cases after a bombardment *x*-ray examination of every case was impracticable.

The Service of the General Practitioner

The younger surgeons having been called up into the army, all the hard work of civil defence in Barcelona fell upon the older men. In Catalonia no men over 40 were mobilized, and thus all the surgeons of considerable experience were able to deal with air-raid casualties until the final stages of the war, when general mobilization was ordered. Even so, the number of available surgeons proved small in relation to the need brought about by frequent heavy bombardments, and general practitioners were included in the surgical units. Each unit in the hospitals of Catalonia was made up of eight medical men, including four surgeons, with some general practitioners as assistants when the number of available surgeons was not sufficient. There was also one ophthalmic specialist and one ear, nose, and throat specialist in each unit. General practitioners assisted with the *x*-ray work and blood transfusions. Physicians were in charge of the clinical work in the hospital wards, for on many days it was not possible for the surgeons to leave the operating theatres. Dr. Trueta gave some graphic details of what it was like to work under such conditions: the sense of insecurity after repeated bombardment, and the effect which the sight of severely wounded people, among whom might be discovered one's own friends and relatives, had upon those engaged in the work. Only a sense of unavoidable duty made it possible to carry on efficiently in circumstances of such depression.

For general practitioners the bombardment of great cities also brought another kind of task. As a consequence of the evacuation of the child population and its concentration in distant places, together with the unavoidable improvisation of living arrangements, every possible measure had to be taken for the prevention of epidemics. In this respect he desired to pay homage to the medical profession of Barcelona, for, despite the bad food conditions at the beginning of the war, only two epidemics occurred, one of diphtheria and the other of typhoid, the latter among soldiers in two centres at the front. Both epidemics were controlled, the diphtheria by inoculation of serum and the typhoid by improved sanitation, better feeding, isolation, and other preventive measures. The organization of preventive measures was hindered during the first six months by revolutionary disorder and was made harder by the increase of the population of Catalonia owing to the arrival of evacuated persons from other parts of Spain. When it was remembered that blockade prevented medical supplies from reaching the population it was certainly remarkable that Catalonia should have had relative immunity from the epidemics which had always accompanied war. The foresight of the medical profession prevented the death roll of revolution, war, and aerial bombardment being augmented by deaths due to infectious disease.

Dealing finally with the location of hospitals, Dr. Trueta said that in the innumerable bombardments which Barcelona suffered the five great hospitals, including his own general hospital with 3,000 beds, suffered no damage whatever, but in the little towns in the country hospitals were quite frequently destroyed, and in one such hospital eighty-three were killed and over one hundred wounded. The reason why the Barcelona hospitals were untouched was the better defence of the city, protected as it was by barrages, fighting planes, and anti-aircraft guns, which made it necessary for attacking planes to fly at great altitudes and at extreme speeds. For this reason he thought it better that civilian casualty hospitals should be organized in the large cities. Moreover, evacuation to the hospitals in the smaller towns and villages was often very difficult, with roads and bridges destroyed and possibly an inadequate ambulance service.

Discussion

Mr. W. MCADAM ECCLES asked what Dr. Trueta would consider to be the proper percentage of casualty beds for a given population. He hoped the term "*first*-aid post" would be dropped. There were first-aid parties who had to send certain cases to aid posts. It was extremely difficult for such parties to discriminate as to the type of case that should go to an aid post and not to a hospital. But aid posts could act as buffers. Might not such posts in a city like London be of great service, not merely to the people who were unwounded though frightened and perhaps bruised, but also for certain fracture cases? Should not aid posts be so equipped as to be able to send to hospital by ambulance or even by stretcher those cases which had been found to be of such a nature as to necessitate operation immediately somebody in authority said that the case should go? There might be some delay, but as against that there would be a certain relief of overcrowding in the casualty hospitals.

Dr. WALLER asked whether it would not be better to take a case of multiple wounds straight to hospital instead of to the aid post. Dr. G. DE SWIET asked what was the lecturer's experience of black-out conditions in Spain. He believed that in a black-out many lives would be lost simply because surgeons could not get to the victims in the darkness. Dr. CAMPS said that it had been suggested that practitioners who were relatively unskilled should not do anything to the injured people, but stand by, leaving the injured limbs exposed during perhaps a four- or five-mile journey to hospital, the aid posts being of no service except for superficial wounds. He wondered what the ambulance service in Barcelona was like. His own experience after riding in ambulances which were converted lorries was that, although he was uninjured to start with, he felt very much injured by the time the journey ended! What was likely to be the conditions of a victim on a five-mile journey?

Dr. TRUETA replied that the number of available beds in Barcelona, a town normally of one and a half million inhabitants but with a population very much increased under war conditions, was little more than 10,000. The beds were not nearly sufficient after a heavy bombardment, but it was possible to send many patients out of the town to country hospitals. His plan had been to conduct the operation in the town hospital as quickly as possible, employing the closed method with plaster-of-Paris, which enabled the patient to be moved within three or four days to a hospital perhaps a hundred miles distant, far outside the area of attacking planes. The Barcelona organization would be more applicable to towns like Manchester or Liverpool, for London needed its own special service. He thought that immobilization in a stretcher, if the ambulance man knew the simple principles of putting the wounded in good position with sandbags, was quite appropriate for a journey to hospital which occupied generally only ten or fifteen minutes. As for the black-out, the conditions were rather different in Barcelona. The warning was received ten or fifteen minutes before the actual bombardment, and central control at the electricity stations enabled the town to be plunged immediately into darkness, and the current was turned on again after the raiders had passed. In reply to a further question, he added that gas was not employed in any of the raids on Barcelona.

On the motion of Dr. JAMES FETTES, seconded by Dr. BOYD, a hearty vote of thanks was accorded to Dr. Trueta.

Ovarian Activity and Psychological Processes.—This is an important paper correlating hormonal activity, studied by means of vaginal smears and basal body temperatures, with independent psycho-analytic study of the emotional state. This is apparently the first satisfactory attempt to make use of accurate methods of this kind to study the hormonal background of human instinctual activity.—Correlations between Ovarian Activity and Psychodynamic Processes: I, Ovulative Phase. T. Benedek and B. B. Rubenstein.—*Psychosomatic Med.*, April, 1939, **1**, 245.

NEUROSES IN WAR TIME

MEMORANDUM FOR THE MEDICAL PROFESSION

A conference first convened by the Minister of Pensions in July, 1939, to advise the Government as to general principles for dealing with cases of nervous breakdown which may become manifest in war time has now reported to the Minister. The members of the conference were as follows:

Lord Horder (Chairman), Sir Hubert Bond, Sir Farquhar Buzzard, Dr. Bernard Hart, Dr. Gordon Holmes, Dr. J. H. MacDonald, Professor Mapother, Dr. Crichton-Miller, Dr. T. A. Ross, Sir James Purves-Stewart, Dr. Aldren Turner, together with the Directors-General of Medical Services of the Navy, Army, Air Force, and the Ministry of Pensions.

Besides making other recommendations, the conference has suggested that the following notes be circulated to all members of the medical profession.

During the last war the occurrence of large numbers of neuroses engendered by fear, shock, exhaustion, physical and mental strain, or lack of sleep, and the rapidly increasing incidence of these from 1916 onwards, caught both the Services and the medical profession unprepared with any organization by which to deal with them or with any agreed method of treatment applicable to them. The result was an accumulation of a very great number of this type of "casualty" and a consequent lowering of the general morale.

These neuroses were popularly called "shell shock," a term which came into use in 1914, when it was believed that the great bulk of nervous disorders noted in the field of war had their origin in the physical effects of concussion by high explosives or of poisoning by gases. At that time this theory was widely prevalent, and was even promulgated by neuro-psychiatrists of experience. It soon became obvious that this view could not be justified, since precisely similar disabilities, and in the same proportions, occurred not only among men who had not been subjected to any such exceptional exposure but also among those who had not been over-seas. Moreover, the nervous disorders arising during the war differed in no material way from those well known in civil life. Again, many men who were blown up or buried to the same extent were able to return to duty without admission to hospital and without apparently suffering any durable effects.

However, the term "shell shock" soon became a catchword among the troops, and was welcomed by the man suffering from nervous symptoms, as he did not realize, or could not admit to himself or to others, that he might be suffering from the effects of fright or terror. The catchword appealed to the public imagination as an excellent term by which to explain a condition which could not easily be understood, and was too often adopted by the medical profession itself as a diagnosis for any functional nervous disorder appearing in soldiers during the war. Such was the appeal of the words "shell shock" that this class of case excited more general interest, attention, and sympathy than almost any other—so much so that it is feared that it became a most desirable complaint from which to suffer.

Most of these neuroses occurred either in the form of an anxiety state or as hysteria.

Anxiety States

Anxiety states reveal a common characteristic—the constant presence of fear or anxiety accompanied by vasomotor and visceral concomitants to a greater or less extent. Some are cases of mild type in which the anxiety is simply a prolongation and exaggeration of the natural anxiety experienced by everyone when exposed to war conditions. The feeling of fear is the normal reaction to threatened danger when the impulses activated by the instinct of self-preservation are aroused, but these impulses have to be kept under control if an exhibition of cowardice is to be avoided. The source of this anxiety is very commonly the fear of being found afraid and the fear that control of these natural impulses, which

are regarded as shameful, will not be forthcoming when the occasion arises. In some instances natural anxiety is aroused by the fears connected with loss of business and other financial and domestic worries caused by the dislocating effects of war. In cases of more severe type the condition is induced by morbid anxiety in which there is no apparent logical connexion between war experiences and the symptoms of anxiety. In such cases the anxiety is out of all proportion to the apparent exciting cause or it may appear to have no obvious cause at all, though rationalization on the sufferer's part may seem to account for it. In most of such cases it is experienced as a diffuse state of emotional tension undirected to any specific object or situation and causes a state of fearful expectation, the patients being described as "anxious" and "apprehensive." In a few predisposed cases the anxiety reaction is characterized by the development of phobias, or the anxiety may be transferred from its original object to some other situation which appears to the patient to afford reasonable grounds for apprehension, or to preoccupations of a hypochondriacal type. It may be accompanied at the outset by some degree of depression, or depression may be a secondary development after the anxiety has been concentrated on the symptoms themselves and a vicious circle has been set up.

Hysteria

Hysteria, more than any other form of mental reaction, provides the clearest example of the onset of neurosis due to failure of adaptation as the result of conflict between individual needs and social requirements. Suggestion is the most important factor as a cause for the symptoms. Physical manifestations of severe emotional disturbance such as mutism and tremors, or the effects of a minor physical injury producing some temporary loss of power in the limbs, are readily perpetuated as hysterical symptoms by means of suggestion in men who have been subjected to physical or mental stress. Suggestions by medical officers or other attendants, in the course of examination and treatment, may have serious results and are often responsible for the onset of such symptoms.

Underlying the process of suggestion is a conflict between the instinct of self-preservation on the one hand and ideas of duty and self-respect on the other. The development of the symptom satisfies the patient's ethical requirements, provides an escape from duty on the ground of physical incapacity, and at the same time gives effect to his individual needs by removing him from an intolerable situation. In a sense hysteria is thus an unwitting purposive or defence reaction, the patient being unaware of any such motivation. This unconscious motive is a factor of the first importance because not only is it responsible for the onset of the neurosis but it helps to perpetuate it until such time as the conflict is solved by other means. It is aggravated by popular misconceptions as to the nature of the neurosis, by public opinion, by the sympathy of friends and acquaintances, and if it achieves its aim—namely, invaliding from the battlefield or the Service—the bad influence exercised is shown by an increase in the incidence of these neuroses. Further, if it should lead to any economic gain treatment is extremely difficult or often useless.

In 1920 the Army Council appointed a committee to collate the expert knowledge derived by the Service medical authorities and medical profession from the experience of the war with a view to recording for future use the ascertained facts as to the origin, nature, and remedial treatment of "shell shock." This committee issued a report in 1922 (Report of the War Office Committee of Inquiry into Shell Shock, H.M. Stationery Office, 1922). The committee reported:

(1) The term "shell shock" has been a gross and costly misnomer, and the term should be eliminated from our nomenclature. It is a catchword which reacts unfavourably on the patients and on others.

(2) The war produced no new nervous disorders, and those which occurred had previously been recognized in civil medical practice. The cases divided themselves into three main classes:

(*a*) Genuine concussion without visible wound as a result of shell explosions; this formed a relatively small proportion—5 to 10 per cent. of all the cases of shell shock.

(*b*) Emotional shock, either acute in men with a neuropathic predisposition or developing slowly as a result of prolonged strain and terrifying experience, the final breakdown being sometimes brought about by some relatively trivial cause; these formed 80 per cent. of all cases.

(*c*) Nervous and mental exhaustion, the result of prolonged strain and hardship.

(3) Authorities are agreed that in the great majority of (chronic) cases of war neuroses there already existed a congenital or acquired predisposition to excessive and therefore pathological reaction in the individual concerned, and that this constitutional factor was of vast importance. It appears equally certain that the neuroses of war may manifest themselves even in those of sound nervous constitution provided stress be sufficiently severe and/or prolonged.

(4) No case of psychoneurosis or of mental breakdown, even when attributed to shell explosion or the effects thereof, should be classified as a battle casualty any more than sickness or disease is so recorded.

(5) The following factors are generally regarded as tending to increase the incidence and severity of mental and nervous disorders in time of war:

(*a*) All those factors by which a soldier, or even a potential soldier, is encouraged to believe that the weakening or loss of mental control provides an honourable avenue of escape from military service at whatever period of his service.

(*b*) The ignorance of the general community, both civil and military, together with a lack of interest evinced by the medical profession before the war, regarding the origin, nature, and significance of mental, and especially emotional, disorders.

(*c*) All those preventable conditions which undermine a man's mental and physical health and lower the power of resistance—for example, bad sanitation, bad accommodation, abuse of alcohol and drugs, venereal disease, etc. In promoting and maintaining morale, good food, good housing, recreational relaxation, and attention to the comfort and well-being of the soldier are of the greatest service.

(*d*) The introduction and perpetuation of the term "shell shock."

(*e*) The employment of such terms as "N.Y.D.N.," "D.A.H.," or other designation which may become catchwords and thereby lead to an increase in the number of cases.

Diagnosis of Concussion and Emotional Shock

It is important that cases of concussion should be differentiated from cases of acute emotional shock not only because inappropriate treatment of the latter in the early stages retards recovery but also because incapacity certificates for physical injuries under the Personal Injuries (Emergency Provisions) Act apply to cases of concussion. The diagnosis of concussion should be made only when the history or clinical symptoms leave no reasonable doubt that the patient has suffered physical injury by the direct explosion of a shell, by being knocked over by it or by being buried under debris of a building or shelter. The concussed patient becomes immediately unconscious or is at least severely dazed or stunned. This loss of consciousness may last for a few minutes to several days. When the immediate effect passes off there is complete amnesia for a period immediately before and after the injury. The patient is consequently unable to say what happened to him and it is not possible to restore his memory by any therapeutic measures. Patients suffering from emotional shock also frequently state that they became unconscious after the incident to which they attribute their symptoms, but by careful questioning it is usually found that they can recall eventually most of their experiences.

Evidence of Physical Injury

Evidences of direct physical injury are often associated with concussion, such as rupture of the tympanic membranes, epistaxis, contusions, and, more rarely, signs of organic injury of the nervous system. The symptoms vary with the severity of the condition and with the interval between the injury and the day on which the patient is examined. The early symptoms seen as the patient is regaining consciousness can rarely be mistaken, but those of later periods are often misinterpreted. These are neither invariable nor constant, but the most characteristic are headache, pain and stiffness of the neck, vertigo, mental and physical inertia with drowsiness and heavy sleep, which is rarely disturbed by dreams or nightmare. The pupils may be irregular and their reaction to light may be sluggish. In the early stages the tendon-jerks are usually depressed, but later generally become brisk or exaggerated. There may be fine tremors of the limbs, but the coarse tremulousness of the limbs and head which is so common in the neuroses does not develop in concussion. The headache of concussion is usually better in the morning and early part of the day and increases from fatigue as the day advances. As distinct from the neuroses there is an absence of emotional instability.

Emotional Shock

Acute emotional shock may develop independently of any close exposure to the place of explosion. The fact of being subjected to bombardment or air raid or seeing horrifying sights may suffice to precipitate it. An avalanche of emotion seems to overwhelm the patient's consciousness, releasing primitive reactions. The clinical picture in the more severe cases may be one of terror, stark panic, and confusion or one of physical and mental collapse. In the former type the tendency is to hyperactivity—aimless running, incoordination, incoherence, screaming, and disorientation. In the latter type the reverse condition of stupor of greater or less degree may occur. In this state it is difficult to gain the patient's attention and it may be impossible to elicit information. The patient may sit or lie about in an apathetic state and may be shaken with violent tremors. In such cases there may be a cataleptic state for a considerable time. In milder cases of this type stupor is less profound, and the patients may carry out simple actions, but in a slow and hesitating way. They present a dazed or confused appearance, are easily startled, and take little notice of what is going on around them. The stupor may last from a few hours to several days and then pass off suddenly or gradually.

Treatment

The immediate treatment of patients exhibiting nervous symptoms due to fear, anxiety, and other mental factors during and after air raids is extremely important, as if they are neglected the morale of the population suffers seriously. *Such terms as "shell shock," which may suggest that these nervous symptoms have a physical basis or are due directly to injury, must be rigidly avoided.* The following is an extract from the Emergency Medical Service Memorandum issued by the Ministry of Health dealing with the treatment of neuroses:

"The first essential in the handling of these patients when they arrive at an aid post is to convince them that their symptoms indicate no serious injury and that they will soon disappear. This necessitates reassurance and the re-establishment of self-confidence combined with such methods as may lead to even temporary disappearance or abatement of the symptoms. This requires a firm and authoritative but sympathetic attitude on the part of the medical officers and their assistants. In patients who are simply frightened and in emotional cases reassurance combined with an appeal to personal and patriotic pride and a large dose of bromide will usually be sufficient. The patients should then be sent to their homes.

"When confusion, excitement, loss of memory, and disorientation are the chief symptoms, rest, warmth, hot drinks with plenty of sugar or a dose of bromide (gr. 20–30) or phenobarbitone (gr. 1) will be necessary. When patients are restless or excited a hypodermic injection of morphine (gr. ¼) or preferably an intramuscular injection of sodium phenobarbitone (gr. 1½) combined with hyoscine hydrobromide (gr. 1/100) may be required. The latter is provided in tablets which are easily soluble.

"It may not be possible to retain these patients for long in aid posts and smaller medical establishments, but every effort should be made to return them to their homes if they improve sufficiently to do so with safety.

"When hysterical symptoms predominate an attempt should be made at once to influence or remove them by suggestion—for instance, by showing the patient that a powerless limb is not paralysed or anaesthetic, or by making a speechless patient phonate by coughing and then utter a single sound as 'Ah.' Hysterical tremor can be usually arrested by making the patient relax his muscles.

"It is of fundamental importance for medical officers to understand that as the incidence of neurosis is determined by psychological factors, the severity and duration of the disorder and its extension to other individuals depend in many cases on the treatment which it receives at the onset. If patients in whom such a step is not absolutely necessary are transferred to hospital the conditions from which they are suffering may be accentuated or prolonged and the extent of neurotic disorder in the population may be greatly increased.

"Every effort must therefore be made after the preliminary treatment, and whenever it is possible to do so, to send such patients back to their own homes, under escort if necessary. It will, however, be necessary in many cases to provide for sending these cases home, and consequently the question of transport and escorts will have to be considered by those responsible for organizing the aid posts. Such arrangements are not likely to be difficult where the patients reside in the area where the raid occurs, but in the case of patients occupied in the vicinity but living in the outer area some difficulty may be experienced, and therefore it is a contingency which should be borne in mind in advance. The services of some organization which is arranging to send other patients to their homes from hospital might be made available (see Emergency Medical Service Memorandum No. 2, paragraph 29).

"As it will rarely, if ever, be possible for a specialist to visit an aid post it will be necessary for the medical officer to evacuate those whom it has not been found practicable to send home to a 'casualty' hospital.

"Again, it cannot be hoped that there will even be a specialist on the staff of every casualty hospital, and therefore the medical officer of the aid post should ascertain which of the 'casualty' hospitals nearest to his aid post is so provided. This will avoid unnecessary delay in getting the needs of the case decided. The desirability cannot be over-stressed, however, that in circumstances that may be expected in a future state of emergency every patient suffering from a neurosis, unless the symptoms are so severe or prolonged as to make this course impossible, should be sent home. General practitioners should not send cases arising in their private work to first-aid posts but direct to the special clinics which will be set up in connexion with casualty and intermediate hospitals."

The Board of Education in a recent circular draws attention to the need for greater provision for the social and physical development of boys and girls between the ages of 14 and 20 who have ceased full-time attendance at school. This problem, the circular states, has long been neglected in this country, and in spite of the efforts of local authorities and voluntary organizations less than half of these boys and girls belong to any organization which can cater for their needs. Further, the conditions produced by war, the "black-out," and the strain and disorganization of family life constitute a serious menace to youth. The Board has accordingly undertaken a direct responsibility for youth welfare, and has appointed a National Youth Committee to advise it, while a special branch of the Board will deal with grants and other administrative duties. This National Youth Committee will have as its counterpart local committees, which in some cases will be subcommittees of the local authority and in others will represent all local interests. These committees will ascertain local needs, decide where help can best be given, and plan future development. It will not be their task directly to conduct youth activities, but to strengthen the hands of local authorities and voluntary organizations.

Correspondence

R.M.B.F. Christmas Gifts Fund

SIR,—I write on December 1 to acknowledge the sum of £278 13s. 6d. which has been received in donations towards our Christmas Gifts Fund. This will enable us to distribute gifts to our annuitants, but we also have 300 to 400 beneficiaries on our books who are in receipt of regular and annual grants. Their circumstances are similar to those of our annuitants, and in previous years they have also received the Christmas Gift. I should be very grateful if those of your readers who have not yet contributed would send a donation, however small, addressed to

Royal Medical Benevolent Fund,
Christmas Gift Account,
Wormingford, Essex.

At Christmas, 1938, we distributed £1,174, and I hope we may be able to do the same again this year, but time is short. —I am, etc.,

THOS. BARLOW,
President.

Active Service Medical Societies

SIR,—In times of stationary warfare, and particularly in the winter months, it becomes necessary to invent schemes for the counteraction of boredom and the maintenance of interest and efficiency. For the medical services there can be nothing better for this purpose than the medical society, with all its opportunities for exchange of "shop" and useful information, and with as regular and varied a programme as circumstances may permit. Medical meetings, whether under the auspices of a local society or not, played their part in the last war and are sure to be revived. Such societies may be small or large and based on an army or a corps, or have their centre at a base, or in hospitals and training areas at home. They can combine a social with scientific purpose, and their meetings should not become too formal. In the case of the Expeditionary Force they should be able to draw upon consultants or medical or surgical specialists attached to base hospitals and casualty clearing stations for papers on clinical topics. Talks among ambulance and regimental officers on aspects of their work can be equally valuable if less clinical. Pathologists and medical officers connected with sanitation and the many-sided problems of venereal disease should also have their contributions to make. Directors or assistant directors of medical services may be very profitably invited to give instruction and advice on administrative subjects and to recount experience of other campaigns to units mainly composed of civilian doctors.

The educational approach to the venereal disease problem—as opposed to the mere provision of preventive packets—and how it may best be organized for different types of unit and different ranks inevitably requires free discussion in our younger modern army. The practical and theoretical implications of the surgical methods advocated by Trueta; the known and possible contributions, and also the dangers, of sulphonamide treatment in sepsis, pneumonia, meningococcal meningitis, and gonorrhoea; the management of shock and chest wounds; the old P.U.O. problem—all these should provide food for discussion even before the advent of battle. Few problems call for more careful consideration than that of D.A.H. or soldier's heart. Many physicians, in retrospect, must feel convinced that there was a wholly unnecessary sick wastage from this cause in the last war and that physical and infective factors (as opposed to emotional factors) were far too extensively blamed, even by cardiologists of distinction who had not seen cases in their early stages and in their causal environment. A large proportion of all cases could have been reclaimed by simple psychotherapy and physiotherapy, without hospitalization or invaliding and with a great saving of expense to the country. The soldier is a simple and sensible fellow for the most part, but, like the civilian, he can either be made into an invalid by a wrong treatment or label or cured of many of his functional disorders by straightforward explanation and reassurance and short respites from bad conditions. Reminders of the advantage of re-educational camps, instead of hospitals, for all the minor neuroses (a late lesson of the last war) cannot be brought too soon to the notice of the whole medical service.

A lending library at the base and a system of circulation of important journals, manuals, and reprints should not be beyond the dreams and the scope of the best-organized army medical corps in the world. The keeping of medical notebooks and diaries should everywhere be encouraged.

Many of us look back upon our medical and surgical experience of the last war as one of the most vivid and instructive experiences of a lifetime. The good comradeship, the complete absence of the competitive evil, the living and working at close quarters of friendly teams, the direction of unanimous effort to the one object of doing the best possible both for the Service and for the individual sick or wounded soldier, sailor, or airman—all these provide an atmosphere which might with advantage, but does not yet, exist in our less united and less whole-hearted civilian organizations.

With the addition of research teams and base or army schools or instructional courses the welding and evolution of the military medical machine in time become complete and lend full support and inspiration to the common cause. The particular functions of the medical society are to bind and to leaven the official work, to facilitate exchange of views, and to maintain enthusiasm and the spirit of inquiry essential to all good medical service. We are all confronted with a new phase of postgraduate education, and Osler's happy reflections on "The Educational Value of the Medical Society" are as worthy of attention in war time as in times of peace. —I am, etc.,

Cambridge, Dec. 11. JOHN A. RYLE.

Evacuation of Small Children

SIR,—The evacuation of small children between the ages of 2 and 5 introduces major psychological problems. Schemes for evacuation are being thought out, and before they are completed we wish to draw attention to these problems.

There are dangers in the interference with the life of a toddler which have but little counterpart in the case of older children. Evacuation of older children has been sufficiently successful to show, if it were not known before, that many children over 5 can stand separation from home and even benefit from it. It does not follow from this that the evacuation of smaller children without their mothers can be equally successful or free from danger.

From among much research done on this subject a recent investigation carried out by one of us at the London Child Guidance Clinic may be quoted. It showed that one important external factor in the causation of persistent delinquency is a small child's prolonged separation from his mother. Over half of a statistically valid series of cases investigated had suffered periods of separation from their mothers and familiar environment lasting six months or more during their first five years of life. Study of individual case histories confirmed the statistical inference that the separation was the outstanding aetiological factor in these cases. Apart from such a gross abnormality as chronic delinquency, mild behaviour disorders, anxiety, and a tendency to vague physical illness can often be traced to such disturbances of the little child's environment, and most mothers of small children recognize this by being unwilling to leave their little children for more than very short periods.

It is quite possible for a child of any age to feel sad or upset at having to leave home, but the point that we wish to make is that such an experience in the case of a little child can mean far more than the actual experience of sadness. It can in fact amount to an emotional "black-out," and can easily lead to a severe disturbance of the development of the personality which may persist throughout life. (Orphans and children without homes start off as tragedies, and we are not dealing with the problems of their evacuation in this letter.)

These views are frequently questioned by workers in day nurseries and children's homes, who speak of the extraordinary way in which small children accustom themselves to a new person and appear quite happy, while those who are a little older often show signs of distress. This may be true, but in our opinion this happiness can easily be deceptive. In spite of it children often fail to recognize their mothers on returning home. When this happens it is found that radical harm has been done and the child's character seriously warped. The capacity to experience and express sadness marks a stage in the development of a child's personality and capacity for social relationships.

If these opinions are correct it follows that evacuation of small children without their mothers can lead to very serious and widespread psychological disorder. For instance, it can lead to a big increase in juvenile delinquency in the next decade.

A great deal more can be said about this problem on the basis of known facts. By this letter we only wish to draw the attention of those who are in authority to the existence of the problem.—We are, etc.,

JOHN BOWLBY.
EMANUEL MILLER.
D. W. WINNICOTT.

London, W.1, Dec. 6.

Psychological Casualties in War

SIR,—Dr. R. D. Gillespie's reply (*Journal*, December 2, p. 1110) to my letter (November 18, p. 1020) accuses me of polemics resembling Hitlerian propaganda. He makes use also of that least admirable of arguments, the sneer. I am in fact an admirer of the ingenuous Socratic method, and believe myself to be quite unskilled in the subtler technique of Goebbels. "The assertions made," Dr. Gillespie says, "are so roundly extravagant as to stupefy opposition." The heavy artillery of authority is brought to bear on me, although I introduced my main contentions with the words "I think" or "I believe." I think this is not the method of assertion.

Strangely enough, I appear to have a greater belief in the need for Dr. Gillespie's special line than he himself has. In the recent years of so-called peace the demand for psychological treatment has been such that some patients were promised treatment at one centre in the quite remote future. The period of waiting was two years or even longer. Here was an urgent problem which I, and at least some others, believed the war would make more urgent. The departments attached to general hospitals are valuable, and some patients prefer to attend these. I think, however, that Dr. Gillespie will find it difficult to convince general practitioners that they should not send their patients to "psychotherapeutic centres" which exist apart from general hospitals. In his letter in your issue of November 4 (p. 926) he says of such centres, "The divorce of psychotherapy from general medicine is apt to have as its consequence a divorce from sanity." We allow the aurists and oculists to have buildings of their own without protest. We even have a hospital for diseases of the rectum. Why deny the psychotherapists centres of their own? All specialists have to guard against a too narrow professional outlook, no matter what sort of building they attend.

Dr. Gillespie says, "No psychiatrist will agree that 'any of us is capable of being [*I* wrote *becoming*] psychotic.'" I had hoped that this idea was at least worth thinking about. It was in any case not asserted, but presented as a personal belief and a corollary to the hypothesis that in fortunate circumstances potential psychotics might fail to become actual. It is surely heroic to postulate for anyone an absolute immunity to psychosis. There is evidence in favour of my suggestion which goes some way towards proving it. Psychosis is sometimes cured. We might consider the cured psychotic as someone who has recovered from an illness that "the flesh is heir to." In the *Journal* not long ago you published an account of some cases of certified psychosis for whom it was claimed that dental treatment cured them. Various infections, toxaemias, and poisons have the effect of producing as a by-product symptoms of psychosis, and even clear-cut psychotic syndromes—for example, Korsakow's psychosis and G.P.I. A large book has been written by Dr. W. K. Anderson on malarial psychoses. Individual predisposition, rightly emphasized by Dr. Gillespie, may be a factor in all such cases, but how far is it a factor? Stress or trauma of some kind is, I believe, also a factor in every case of psychosis, and every human being has, I think, a threshold of vulnerability. —I am, etc.,

London, S.E.14, Dec. 3. ALLAN A. MACDOUGALL.

Treatment of War Fractures by the Closed Method

SIR,—Dr. Trueta's address on this subject, published in the *Journal* of December 2 (p. 1073), is one which every surgeon who may be called upon sooner or later to deal with wounds from war missiles should read with care. His conviction that to avoid true shock—that is, septic infection—operations for compound fractures must be performed within a time limit of two hours is one with which we shall all agree. If wholesale bombing of large cities should ever be indulged in this optimum time will, I am afraid, be very often exceeded.

The outstanding lesson of the last war as regards surgical treatment was that complete débridement of wounds was the first great essential, especially the complete exposure of the whole track of a wound and the ruthless cutting away of any dead or dying muscle. The rough-and-ready methods of deciding if muscle is in either of these conditions as evidenced by its appearance—pale pink instead of a deep red colour—and its failure to contract when nipped by dissecting forceps, are the only practical rules for the surgeon's guidance. When he has carried out these essential principles, and if the optimum time has elapsed, what guarantee has the surgeon that he has forestalled all risk of sepsis from *B. welchii* or streptococcus? The answer is, None.

If that is so there is one sentence in Dr. Trueta's address which is worthy of special notice: "When in spite of this excision there is still doubt about the vitality of the tissues that remain . . . it is essential to wait two or three days before putting on plaster." This is sound advice indeed, and it needs to be stressed; because the impression had got about that Dr. Trueta advocated the use of plaster-of-Paris in *all* cases. By covering up a doubtful wound in a plaster case the surgeon will thereby deprive himself of the use of two faculties which should warn him that all is not well with the wound. The information to be gained from the use of eyes and nose is too precious in doubtful cases to mask it under a covering of plaster.—I am, etc.,

York, Dec. 3. J. G. CRAIG.

Bipp

SIR,—In the *Journal* of December 9 (p. 1164) I see a letter with the heading "Bipp." The writer evidently does not know the true composition of it or its history, or of the fact that it was conceived by a very distinguished Newcastle surgeon, the late Professor Rutherford Morison, during the great war. After his discovery of this substance he was asked to go over to France to instruct the Army surgeons there how to use it, and he did. Whoever the individual was who gave the formula given in the letter was wrong. Undoubtedly Morison's "bipp" did revolutionize the treatment of war wounds. To put the matter beyond dispute I quote a passage from a letter sent by Professor Morison to one of his old house-surgeons, Professor Willan of Newcastle. On May 27, 1916, he writes:

"You will be glad to hear I have accomplished the greatest thing for surgery in this war. I have discovered an antidote to true sepsis, and we are now about to leave dirty wounds undressed for a whole month. Think of what this means for compound fractures. Programme: open up and clean the wound; mop it out with spirit, then fill it with paste and cover with dressing. Paste: Iodoform two parts, bismuth subnitrate one part, paraffin q.s. to make a paste. Compound fractures have done with a dressing which has been left for two to four weeks, and several of them have united in less than six.

"It took twenty-five years to make surgeons believe I could get large aseptic wounds to heal without drainage under a single dressing. I hope that the same time will not be taken in getting the same belief accepted for septic ones, but I fear it. There is

another thing I fear, and it is that we may discover drawbacks; I am honestly looking out for them, but so far without success."

The original "bipp" contains neither glucose nor balsam of Peru nor bismuth subgallate. I like to see honour given where it is due.—I am, etc.,

Newcastle-upon-Tyne, Dec. 10. ROBT. A. WELSH.

Relapses after Sulphonamide Treatment of Gonorrhoea

SIR,—I have read with much interest in your issue of December 2 (p. 1080) the article by Mr. A. J. Cokkinis and Dr. G. L. M. McElligott on relapses after sulphonamide cure of gonorrhoea. I am afraid that some of us at the Whitechapel clinic were rather doubtful about the success of these "cures," and we have been justified subsequently by the number of relapses which have occurred, both early and late, during the period of observation. It was with this point in view that some considerable time ago the period of observation in females was extended from three to six months, and that also one set of tests at least was taken during the monthly menstrual period. This course seems now to be necessary.

There are three factors which lead me to expect a further increase in relapses, namely:

1. The marked increase in the defaulter rate since the institution of sulphonamide treatment: many cases disappear as soon as all symptoms have gone, before ever submitting to a proper test of cure or before the test of cure is completed.

2. The neglect of attention regarding the complement-fixation test. With this I know many people will disagree, as great variation occurs with regard to its interpretation. In my own experience I am convinced that a patient with a strongly positive (++) or a positive (+) reaction should be viewed with great suspicion when assessing a test of cure, while *one* single negative test should never be regarded as concrete evidence of cure.

3. The last factor is the failure to include in the tests of cure a culture, plate if possible, from the posterior vaginal fornix, where infection may be most persistent.

In conclusion, it would appear to me that since the advent of sulphonamide treatment there has been a marked increase in the so-called gonococcal carrier. I should be glad of the views of other readers on this point.—I am, etc.,

W. NEVILLE MASCALL,
L.C.C. (Whitechapel) Clinic, London, E.1, Dec. 5. Chief Assistant Medical Officer.

SIR,—We welcome the article of Mr. Cokkinis and Dr. McElligott in your issue of December 2 as emphasizing the importance of the recognition of late relapses in the sulphonamide treatment of gonorrhoea, and particularly of the necessity for cultural examination. This was evident to us some months ago, and as a consequence a circular letter was sent out in May of this year by Dr. Newsholme, medical officer of health for Birmingham, to the medical practitioners of the Birmingham area.

But with many points and conclusions in the paper we cannot agree. The authors state that their relapse rate on 1,055 cases works out at 12 per cent. They then proceed to say that more relapses *must* have occurred; we think that such an assumption is, to say the least, unproven. In Table I, by some mysterious process, they raise this relapse rate to 27 per cent. We cannot follow the mathematical conclusions of Table I; apparently they add up the percentages in the right-hand column. Now supposing they carry the time group a little further and, say, in over fifteen months one patient presents himself and is found to be a relapse. The item in the table will then read:

Time Group	Followed-up Cases	Late Relapse	Late Relapse Rate
Over 15 months..	.. 1	1	100 per cent.

They will then obtain a relapse rate of about 127 per cent.!

The Table III intended to be a comparison of three different preparations has many points which would not be good evidence. The number of cases taken for each group of drug differs very widely; the dosage, so far as we can gather, is entirely different. In many cases gonococci were not even present when the sulphonamide treatment began; surely "suspected gonococci" is insufficient evidence in an investigation of this kind. Such factors, in our view, would need a completely reconstructed table, if indeed one could make out a reliable comparison at all on the available information.

Later on in the article we read: "In most cases of proved female gonorrhoea gonococci are demonstrated only in the urethral discharge in spite of the fact that signs of cervicitis are usually present." Frankly, we fail to understand this statement; it is entirely new to us and, we feel sure, to many others. In our clinic we take as routine in all cases of suspected gonorrhoea in the female films and cultures from cervix, urethra, and rectum. In 100 consecutive cases, on the initial examination gonococci were found in both cervix and urethra 57 per cent., in urethra alone 9 per cent., in cervix alone 31 per cent., in rectum alone 3 per cent.

In conclusion, we wish to state that after giving trial to the three drugs sulphanilamide, sulphapyridine, and uleron, we have no doubt that the best of these is sulphapyridine (M & B 693). We have now used sulphapyridine as routine in well over 1,000 male and female cases, combined with vaccine treatment and, in females, local treatment. Our relapse rate works out at 13 per cent. approximately, and many of the cases have been under observation over a year. We admit the possibility or even the probability that such a percentage may have to be reconsidered as the period of observation becomes longer, but we hope not to the degree which has been suggested in the article under discussion.—We are, etc.,

E. W. ASSINDER,
Venereal Diseases Department, General Hospital, Birmingham, Dec. 6. G. H. KNIGHT.

SIR,—In their highly interesting analytical paper on the above subject in the *Journal* of December 2 (p. 1080) Mr. A. J. Cokkinis and Dr. G. L. M. McElligott suggest that the longer treatment and more frequent need for multiple courses with sulphanilamide may account for the lower incidence of late relapses as compared with treatment by sulphapyridine (M & B 693). May I suggest another factor as likely to contribute to this difference in late relapse rates. The patient who under treatment with sulphapyridine has got over his early difficulties with little trouble and no relapses is more likely to report again for treatment in the case of a late relapse instead of becoming discouraged and defaulting as in the case of one who has had early relapses. This is true in spite of the fact that patients are more likely to report their condition if they relapse than if they remain well. On this hypothesis it is probable that the late relapse rate after treatment with sulphonamide compounds is higher than 20 per cent.

In regard to the question of delayed treatment it is not clear whether the figures analysed refer only to randomly selected cases in which the treatment was withheld until the second week or include those cases which did not report before that time. One might with reason regard patients who report in the first and second weeks respectively as belonging to different populations. It is probable that among those reporting in the first week there is a greater proportion of more acute cases, whereas in the second week one is likely to get a self-selected group in which the disease is held in check to some extent by natural resistance or in which the infection has been less severe. It does not follow that withholding treatment for a week from the former group would enable them to attain the same measure of immunity as this latter self-selected group. Again, among the more severe cases in this latter group there is likely to be a higher proportion of the haphazard type of patient who might fail to report late relapses. These considerations suggest that at least when the groups of first- and second-week cases are self-selected one might expect to get figures showing a lower incidence of early and late relapses in the second-week group.

May I conclude by expressing my appreciation of the value of the important paper on which I have based these comments. —I am, etc.,

Rochester, Dec. 2. A. GARDNER, M.B., F.S.S.

Painless Injections of Sulphapyridine (M & B 693 Soluble)

SIR,—Post-operative pneumonia has for many years been the bugbear of surgeons. The blame has at times been cast upon the anaesthetists, but it has been found that this complication may follow spinal and even local anaesthetics. The introduction of sulphapyridine (M & B 693) has given us a valuable remedy in dealing with post-operative pneumonia, but there are certain difficulties in its use. Sulphapyridine taken by mouth is apt to cause nausea and sometimes vomiting. This may be a serious matter in the post-operative care of an abdominal operation, not only on account of the pain and discomfort of vomiting but also because it may cause confusion in diagnosis, it being difficult in some cases to be sure that the vomiting is due to the drug and not to some intra-abdominal complication. For these reasons the intramuscular route after abdominal operations is preferable, but the patients complain of intense pain when given the injection. This is probably due to the drug reaching the subcutaneous tissues either on the outside of the needle or during the insertion and withdrawal of the needle.

To overcome this difficulty I have introduced a two-syringe technique. (1) A 1 c.cm. Record syringe with a No. 2 serum needle is filled with 1 per cent. novocain, a weal is made intradermally, and the needle is driven through this, injecting a little novocain as it goes, until the needle is in the muscle, when 1/2 c.cm. of novocain is injected. The syringe is then detached from the needle, which is left in place. (2) A 5 c.cm. Record syringe with a large needle is used to draw up the sulphapyridine. The syringe is detached from the filling needle and attached to the needle in the patient, and the drug is injected. The empty 5 c.cm. syringe is detached from the needle and the former 1 c.cm. syringe, containing about 1/2 c.cm. of 1 per cent. novocain, is reattached. About 1/4 c.cm. of novocain is injected to clear the needle, which is then withdrawn while the rest of the novocain is injected into the track to prevent any of the sulphapyridine escaping up the track after the needle has been withdrawn. The site is massaged to move the skin on the deep tissues to close the track. If the order of events is followed as detailed above, while the ampoule of sulphapyridine is being opened and the syringe filled the novocain has time to act. The injections are painless when given this way. The patients say they are painless—and not only the nurses, who so frequently report that a patient is "quite comfortable" twenty-four hours after a laparotomy!—I am, etc.,

Hove, Sussex, Nov. 22. H. J. MCCURRICH.

Treatment of Varicose Ulcers

SIR,—It was with interest that I read Dr. J. R. A. Davies's letter (November 25) on the treatment of varicose ulcers by elastic adhesive occlusive dressings. As a dermatologist I have seen numerous cases in which this treatment has been used for this purpose, with the result that eczema, often of the eczema rubrum type, has developed on the leg treated and/or a generalized eczema has started. Years ago I came to the conclusion that if there is the slightest concurrent varicose eczema present, as is often the case, along with varicose ulceration, then the application of elastic, adhesive, and occlusive dressings is absolutely asking for trouble in the form of further skin disorder. After all, most varicose ulcers can be healed by rest or by the application of the old-fashioned Unna's zinc-gelatin supporting bandage. In my opinion the use of the zinc-gelatin bandage, when properly applied and renewed at correct intervals, is still one of the best methods of treating varicose ulcers and/or varicose eczema, although I have also found local applications of Grenz rays to be very useful in eczema rubrum of the legs.

It has been my routine practice for some years, when referring cases of varicose eczema and/or ulceration from the skin department to the varicose vein clinic at the Leicester Royal Infirmary, to send along a note asking them to use no elastic adhesive occlusive dressing. There may be three factors which can cause trouble in such treatment.

1. The locking up of the broken-down tissue products and the damming up of the excretions and secretions of the skin, with their resulting absorption into the system.

2. One of the substances used in the manufacture of these elastic adhesive occlusive bandages coming into prolonged contact with either unhealthy or normal skin, usually the former in these cases, may set up trouble. The composition of the sticky substance on these bandages is usually a mixture of rubber and an oleo-resin, either of which may give rise to trouble on some skins.

3. It is a well-known fact that in many people suffering from or predisposed to eczema the continuous application over any area of skin of even a fairly large-sized piece of plain zinc oxide adhesive strapping for a few days will often start up an eczematous condition under it.

The first factor is partly dealt with by the fact that some of the discharge can escape through the bandage and be wiped off whilst *in situ*, together with the periodical removal and reapplication of the bandage after suitably cleansing the area covered. The second is now apparently realized by the makers of the dressings themselves, by the fact that they market these bandages in the form of half-plastered-width bandages for the same purpose in which only a very small area of the sticky substance, at the beginning of the bandage, comes into direct contact with the skin surface, and this piece is generally under the thick skin of the sole of the foot, which part is not very easily irritated. The third factor cannot be dealt with. Ask anyone who has ever had to have some broken ribs strapped up with adhesive plaster on their skin if after a few days of such treatment they did not feel like giving a very good imitation of a choreic chimpanzee working overtime, in their desire to scratch that area. From what some patients suffering from "a bad leg" treated with elastic adhesive occlusive bandages have told me, this is trivial compared with the irritation they sometimes get while undergoing this treatment, resulting frequently in a "Blitzkrieg" of scratching and further trauma of the insulted dermis.—I am, etc.,

Leicester, Dec. 6. F. A. E. SILCOCK, M.D., D.P.H.

Conservation of Cervix in Prolapse Operations

SIR—May I say how much I have been interested in Dr. J. W. A. Hunter's paper on the conservation of the cervix uteri (*Journal*, November 18, p. 991). In my opinion he has drawn attention to a most important point. For my own part I have been fortunate in not having had any Caesarean sections following amputation. In addition to the reasons mentioned there is one great objection to Schroeder's amputation—namely, its liability to be followed by a secondary haemorrhage about the seventh or eighth day. A bleeding cervix is an awkward complication which usually necessitates bringing the patient back to the theatre and the insertion of stitches. In the usual high amputation, and in Emmet's trachelorrhaphy, the dangers of post-operative haemorrhage are very slight. Emmet's operation is simple to perform and is a most satisfactory method of treating an old laceration.

I was very glad indeed to see Dr. Hunter's reference to the operation of vaginal fixation, which would seem to be a valuable method of dealing with certain cases of prolapse. For several years I have been in the habit of performing a somewhat similar operation—namely, vaginal suspension—and I find that as time goes on I employ it more frequently than formerly. In some few cases in which a period of sterility has preceded operation pregnancy has occurred and labour was uneventful. Cullen of Baltimore produced excellent illustrations of this operation, which, with his kind permission, I reproduced elsewhere. Very briefly the steps are as follows. The anterior pouch of peritoneum is opened, two or three long suspension sutures are inserted into the anterior surface of the uterus, and the long ends of these sutures are passed, respectively, on each side through the peritoneum and through the vaginal mucous membrane about a quarter of an inch from the edge of the colporrhaphy incision. Clips are then put

on these sutures and the colporrhaphy is completed. The uterus is now drawn gently forwards by the suspension sutures, which are then tied.

As Dr. Hunter's paper has reference to prolapse, perhaps I may be allowed to mention one last point. Of recent times the pendulum has swung away from the older operation of interposition. Some few years ago, when in America, I heard the view expressed that interposition was one of the best methods of treating prolapse in an elderly woman in whom there was a large cystocele—that is, a case in which a cystocele is responsible for most of the symptoms. The reason given was that the uterus is thereby made to form a natural shelf for the bladder. There are perhaps objections to the operation, as to many others, but personally I employ it in preference to anything else in certain selected cases of the type just mentioned.—I am, etc.,

Londonderry, Dec. 6. R. E. TOTTENHAM.

Cause of Gastric Ulcer

SIR,—Dr. James Ronald's article in the *Journal* of November 25 (p. 1033) has interested me much as a general practitioner who has believed that it is the high hydrochloric acid content that is largely responsible for gastric ulcer. Dr. Ronald shows that in spite of excess hydrochloric acid the ulcer heals.

So often the determining cause appears to be overwork and over-worry, and especially over-worry, and one has felt there are other factors—perhaps some endocrine disturbance—responsible for gastric ulcer formation beside those of faulty diet, irregular meals, etc. The enzyme or factor that prevents the digestion of the stomach wall ante mortem must, I think, play an important part in gastric ulcer, just as Castle's intrinsic factor has its role in the production of the sequelae of hypochlorhydria and achlorhydria. The stomach of carnivorous animals has, I believe, a far higher hydrochloric acid tolerance than the human stomach. Hog's stomach as ventriculin can supply the lack of Castle's intrinsic factor, and I wonder if the stomach of the carnivora would not supply the factor that may be lacking in the human stomach when ulceration takes place.—I am, etc.,

Tarrington, Dec. 2. H. G. LANGDALE-SMITH.

Fracture of Femoral Condyle

SIR,—I was interested in Professor G. R. Girdlestone's article on fractures in the region of the knee in the *Journal* of December 2 (p. 1099), and would like to ask him a general question regarding operative procedure.

In the section headed "Fracture of One Condyle" he says, "This operation can be done by working through a large window in the plaster." How does he prepare the skin for such an operation? Presumably sterile sheeting would be insinuated beneath the edges of the window during the operation and clipped to skin?—I am, etc.,

Wrexham, Dec. 3. ERIC EVANS.

*** We submitted Dr. Evans's inquiry to Professor Girdlestone, who has kindly supplied the following answer: Dr. Eric Evans asks for details of my technique of operating through a window in plaster-of-Paris. This has been developed as a result of the experience of performing spinal fusion in many cases of scoliosis corrected by the Risser technique. The points are:

1. Previous preparation of the skin with ether and, say, 1 per cent. iodine in spirit. When the patient reaches the operating table it is necessary to:

2. Dust the area with a mop of gauze on a pair of forceps, discarding the gauze and forceps.

3. Cleanse with ether, fresh mop, fresh forceps, starting in the middle and spiralling outwards, again discarding gauze and forceps.

4. Repeat twice with iodine swabs.

5. Apply miniature sterile towels, say 10 inches by 20 inches, placing them very accurately round the window overlapping each other, then carefully expose the area of incision and fix the towel edges to the skin with Michel clips (preferably of the large strong type). These miniature towels can be handled far more exactly than larger ones.

6. Place ordinary sterile towels over the miniature towels to enlarge the sterile field.

N.B.—All the final procedures are best carried out by the surgeon himself, as meticulous care is required.

Stored Blood for Transfusion

SIR,—In the *Journal* of November 4 (p. 908) J. L. Hamilton-Paterson's paper on the use of stored blood for transfusion raised the whole question of the value of such blood. The question is not directly raised by the author, but is implicit in two of his conclusions—namely, that "dramatic improvement is less frequent than when fresh blood is used," and that "blood regeneration is slower." If these statements are confirmed they will doubtless be of far-reaching importance. However, I feel that it should be made clear that at present these conclusions are in the realm of clinical impression rather than of scientifically established fact.

The cases which illustrate the paper give uncertain support for the author's deductions, since the patients include many (for example, gastric ulcers, ulcerative colitis, etc.) who may have bled again after transfusion, and other cases (for example, lung abscess) whose toxic process presumably also continued after transfusion. It is difficult to estimate with any degree of accuracy by haemoglobin readings the value of a transfusion in such circumstances. Moreover, the number of such records in several cases is too small, and in some cases they were ill timed, so that the effect of transfusion cannot be differentiated from the patient's own blood regeneration. Further, haemoglobin percentage is misleading in a case of acute haemorrhage unless there is some indication of circulating blood volume, since the value of a transfusion may be chiefly in increasing blood volume, and may give rise to no increase in the *concentration* of haemoglobin.

There is no reference to the effect of transfusion on the blood pressure in the cases of acute haemorrhage. No records of red cell counts are given, and no cases transfused with fresh blood are described for comparison. It would be a pity if the value of stored blood were to be widely doubted upon such evidence as this, and it is clear that much more work is required before an opinion can be formed.—I am, etc.,

ADRIAN C. KANAAR.
Nov. 20. M.D., M.R.C.P., F.R.C.S.Ed.

Anaesthesia in War Time

SIR,—I was much surprised to read in the article by Professor R. R. Macintosh and Dr. Freda B. Pratt (*Journal*, December 2, p. 1077) the statement that basal anaesthetics such as "avertin, nembutal, and evipan" can be used to allay fear and, therefore, the danger of ventricular fibrillation during chloroform anaesthesia. Surely the consensus is that the association of avertin and chloroform is highly toxic to the liver and that there is real danger of producing acute yellow atrophy of that organ. A statement of this kind in an article deriving from the department of anaesthetics at Oxford can be responsible for not inconsiderable consequences.

While one may subscribe to the view that "CO_2 plays no part in the treatment of patients suffering with respiratory *failure*," I would like to see also stated side by side the point that CO_2 plays a great part in the treatment of respiratory *depression* (my italics). A false impression might otherwise be created by Professor Macintosh and Dr. Pratt's statement.—I am, etc.,

E. MONTUSCHI,
Hither Green, S.E.13, Dec. 4. Anaesthetist, E.M.S.

Barbiturate Anaesthesia

SIR,—Our attention has been drawn to the fact that in our recent article on anaesthesia in war time (December 2, p. 1077) we omitted to point out the merits of pentothal, a drug which is used extensively in this hospital. In the interests of simplicity evipan was mentioned as representative of the group of short-acting barbiturates of which pentothal is a most valuable member. Our special mention of evipan was because we realized that it is at present the most widely used drug of this group. The good features of barbiturate anaesthesia are seen to advantage with pentothal, which, in our hands, has given consistently satisfactory results.—We are, etc.,

Department of Anaesthetics, Radcliffe Infirmary, Oxford, Dec. 8. R. R. MACINTOSH. FREDA B. PRATT.

X-ray Examination of Militiamen

SIR,—In January last by letter I brought to the notice of the War Office the advantages of *x*-ray screen examination of the thorax in respect to acceptance of recruits, receiving a reply that medical examinations would be a matter for civilian medical boards appointed under the Ministry of Health. Incidentally, at the same time I pointed out the value of what may be termed the life insurance history, as, if a recruit had been accepted or rejected as a first-class life, such information would be of obvious value.

I have since followed with interest correspondence subsequent to Dr. J. V. Sparks's letter in the *Journal* of May 13 (p. 1003) in favour of a method of thoracic examination which has been extensively used not only abroad but in large works in this country, which skilled thoracic radiologists can conduct at a negligible cost per individual if the examinations are done *en masse*; but, so far as I am awere, they are not being conducted in the case of recruits. Those with experience of the late war, particularly combatant officers, will recollect how many of the recruits should never have been enlisted. Another aspect of the matter appears, however, to have been overlooked in the correspondence—namely, that, apart from *x*-ray examination of the thorax by recruiting authorities, there is always the possibility for a family doctor to send a prospective militiaman for *x*-ray examination at a hospital if a private radiological fee is not possible, or to a private radiologist for a report, particularly in cases where long knowledge of the patient gives a record of a poor thoracic history.—I am, etc.,

Forest Gate, E.7, Dec. 2. BERNARD LEGGETT.

Virtues of "Brown" Bread

SIR,—Opened by your annotation in the *Journal* of August 5 (p. 289) and by Dr. Alfred C. Jordan's letter two weeks later (p. 426), the reiteration of the superior virtues of wholemeal bread, which is not necessarily the same as brown, may serve as some solace to the public. In normal times the Englishman exercises his right to spend his money as he likes, on pools or white bread, without regard for value obtained, and in these days of "thirty-second" breakfasts his wife is unlikely to experiment with frumenty to redress the loss of vitamin B. But in war time the decision is taken from him, and flour containing a higher percentage of the wheat grain will be milled and sold not because it is popular, nor because his doctor recommends it and the Government thinks it good for him, but because, as Sir Arthur Salter pointed out in *Nutrition and the Public Health*, it is necessary to discourage excessive consumption of the "staff of life."—I am, etc.,

London, S.W.2. Dec. 5. G. D. PIRRIE, M.B., D.P.H.

SIR,—It would appear that many advocates of wholemeal (brown) bread in lieu of white bread lose sight of three facts.

1. White bread, though admittedly lacking in the three important vitamins B_1, B_2, and E, contains more *food* than wholemeal. The average of several comparative analyses by Sir Robert Hutchison shows that, whereas the wholemeal bread contains 6.4 per cent. more non-nutritious ingredients (water, cellulose, and minerals), white bread contains 6.6 per cent. more of the nutritious ingredients (protein, starch, sugar, and dextrin). The only actual food advantage of wholemeal bread is that it possesses an extra 0.2 per cent. of fat.

2. Most people dislike brown bread; they—and especially manual workers—have an almost instinctive preference for white.

3. Your correspondent Dr. Arthur King (*Journal*, December 9, p. 1164) asserts that Italians can from the same quantity of grain turn out seven loaves of brown to six of white. But as the brown loaf contains 5 per cent. more water, as well as more cellulose, the food value of seven loaves is probably only equal to that of the six white. Moreover, as every housewife knows, wholemeal bread rapidly gets dry and stale, and therefore is not an economical asset.

As, however, the poorer classes cannot afford to avail themselves of the varied diet that supplies the vitamins lacking in white bread it is obvious that wholemeal flour is healthier for them. For this reason the enforcement of such a type of flour might be a wise war-time measure.—I am, etc.,

CHARLES M. BEADNELL,
Egham, Dec. 10. Surgeon Rear-Admiral.

Provision of Free or Cheap Milk

SIR,—Before the outbreak of war there existed in Glasgow and elsewhere comprehensive schemes for supplying necessitous children with free meals and a large number of children in the schools with one-third of a pint of milk daily at the price of ½d., the necessitous children receiving this for nothing. The benefits to health accruing from these schemes were acknowledged by all medical authorities. Since the war broke out the children have in many cases not been attending the schools through which the schemes were operated; as a result the whole organization of distribution has fallen into abeyance. The evacuated children are receiving nothing by way of free or cheap milk unless some welfare committee in the reception area decides to undertake the provision of it. So long as there is no question of there being a lack of food, the necessary arrangements should be made between the proper authorities in the evacuation and the receiving areas to ensure the continued working of these schemes. It does not take long for any improvement due to better nutrition to disappear, and the end-result of a long period without the extra food may prove more costly to the nation than would the continuance of the supply.

In addition to the milk schemes for school children there are also in existence schemes for the provision of free or cheap milk to pregnant and nursing mothers, but here again the schemes are not being operated as efficiently or as comprehensively as was previously the case. Is it a case of "women and children last" in this war?—I am, etc.,

Glasgow, Nov. 20. J. JOSEPH, M.B., Ch.B.

Animists and Vitalists

SIR,—In your review of *Life's Beginning on the Earth* (December 9, p. 1141) we read, "Now that vitalism is in full retreat and biochemistry is rapidly advancing . . ." Without inviting a discussion that might be interminable, may I say that it is quite possible for an up-to-date biochemist to be a vitalist or—what is much the same—an animist. Your reviewer's attitude seems identical with that described by McDougall as having existed in the last quarter of the nineteenth century when he wrote, concerning animism, "Its few exponents were generally regarded as survivors from an earlier age, actuated by some theological bias to offer a futile opposition to the conquering march of science" (*Body and Mind; a History and Defense of Animism*, 1911, p. 85). McDougall took a first class in the Natural Sciences Tripos and found in modern science nothing incompatible with animism.—I am, etc.,

London, W.1, Dec. 10. MILLAIS CULPIN.

Personal Hygiene in Syllabuses of Training Colleges

SIR,—The trouble with this subject appears to lie, as Miss F. C. Consitt (*Journal*, December 2, p. 1114) suggests, in the difficulty in agreeing as to what it comprises. This gives rise to the misunderstandings and inaccuracies with which she confronts me.

Miss Consitt would limit personal hygiene to those branches for which we depend mostly upon others rather than upon our own individual efforts, for that is what the word "personal" implies. She cites nutrition, when one man's meat is another man's poison; activity, though rest is often essential; sleep, when even a sermon will not ensure keeping awake; cleanliness, which depends upon the presence of water; warmth, whereas it is the hot countries from which children have to be removed, never from the cold regions; light, when it has to be sacrificed to the whims of the architects. These she classes as fundamental necessities. She omits the two branches without which existence, as such, is impossible—namely, respiration and the production and disposal of our waste products. Without breath there can be no life, and if the waste is allowed to accumulate the living being is soon consumed with the products of its own combustion.

Those teachers who have crossed my path have come from every type of school, and all assure me that they get no sound scientific instruction upon either of these two vital branches and that they are therefore not held responsible for dealing with them among the scholars. Many of them deplore the gap in the syllabus; others do not realize that there is the gap. Some of them are grateful for the help they get from lectures they hear later on the subject.

Dr. Blacktin's treatise on dust tells us that 100 per cent. more foreign particles are to be found in the lungs of the mouth-breathers than in those who breathe naturally through the nose. Dr. Priestley some years ago stated that 80 per cent. of the cases he had examined for deafness were mouth-breathers. Since "gapers in glasses" are to be seen on every side, it is likely that investigation would determine the association of defective sight with open mouths. Yet the unkempt nose passes unnoticed, although, like the city on the hill, it cannot be hid.—I am, etc.,

London, W.1, Dec. 4. OCTAVIA LEWIN.

Nicotine and Blood Sugar

SIR,—I have read with interest the annotation on "Lady Nicotine" (*Journal*, December 2, p. 1098), but note that there is no mention of an important effect of nicotine—namely, a rise in the blood sugar. You state, as is well known, that there is a general impression that smoking lessens appetite and that a cigarette will help to stave off a meal, and that many people in times of stress are apt to substitute smoking for food. It occurred to me some years ago that this effect might be due to a rise in the blood sugar. Working in conjunction with Drs. Shaw and Wood in the physiological laboratory in Leeds, I well remember coming down breakfastless in the morning and deeply inhaling the smoke of two cigarettes. I can assure even the most hardened smoker that this is not exactly a pleasant procedure. We found repeatedly that within twenty minutes the blood sugar had risen from a resting value of near 0.1 per cent. to figures of 0.45 and 0.5 per cent., the effect lasting about ten to fifteen minutes. This fact of a rise of blood sugar does not seem to have been commented upon previously, but there is no doubt that it does occur. I am unable to say whether it is due directly to the action of nicotine or to a secondary adrenaline-like effect.—I am, etc.,

Leeds, Dec. 3. JOHN K. DRUCQUER.

Cancer of the Lung

SIR,—I have had several inquiries regarding my letter in the *Journal* of December 9 (p. 1159). I would like to make it clear that all the figures quoted refer only to mice older than 10 months. This holds also for the last paragraph of the letter.

Our stock of mice is on the whole not very susceptible to tumour growth. About 10 per cent. of the control mice of all ages show tumours of any organ at death. This is not unlike the condition for man; for him about one out of seven or ten deaths is due to cancer of all organs. In the mice of our stock, however, the most frequent tumour is the lung tumour, and mammary or other tumours are rare. As mice younger than 10 months very rarely show tumours of the lung, I have always neglected these in the calculations and used only the figures for mice of older age. As revealed in my papers, mentioned in the letter, we start a dusting experiment with mice about 3 months old, and the dusting goes on for a year. The time factor is important also from the point of view of the dusting. The mice are allowed to fulfil their allotted span of life.

Obviously a man who dies of lung cancer is susceptible to it, and it serves no good purpose to use non-susceptible animals for experiments.—I am, etc.,

London, N.W.3, Dec. 12. J. ARGYLL CAMPBELL.

The Services

R.N.V.R. OFFICERS' DECORATION

The Royal Naval Volunteer Reserve Officers' Decoration has been awarded to Surgeon Commanders R. Hall and H. Parry-Price.

CASUALTIES IN THE MEDICAL SERVICES

ROYAL NAVY

The official list of missing officers who were serving on the *Rawalpindi* when it was sunk by the *Deutschland* and another German ship includes the name of Probationary Surgeon Lieutenant FREDERICK HERBERT WESTON, R.N.V.R. Dr. Weston qualified in 1934, taking the M.R.C.S., L.R.C.P., and in the following year graduated M.B., B.S. of the University of London. Before taking up his naval duties he held appointments at the Mayday Hospital, Croydon, and the St. George-in-the-East Hospital, Stepney.

DEATHS IN THE SERVICES

Lieutenant-Colonel WILLIAM GEORGE PATRICK ALPIN, O.B.E., I.M.S. (ret.), died at Richmond, Surrey, on December 6, aged 80. He was born on September 15, 1859, the son of William Alpin, postmaster of Delhi and later of Calcutta, and was educated at Oscott and St. Thomas's Hospital, and took the M.R.C.S. in 1881, the L.R.C.P. in the following year, and the M.D. of Brussels in 1883. He entered the Indian Medical Service as surgeon on April 1, 1884, became lieutenant-colonel after twenty years' service, and retired on January 6, 1910. He had a somewhat varied career in the Indian Medical Service, more so than most men. He was originally posted to Bombay, but soon after joining was transferred to Bengal. After the usual two years' military duty he entered civil employ in Bengal, but a year or so later obtained political employment under the Foreign Office as agency surgeon of Bhopal, Central India. Some two years later he entered civil employ in the United Provinces, where he spent most of his service, finishing up with another spell of military duty. On his retirement he settled at Ealing, where he was in practice for about fifteen years, after which he went to live at Paignton and a few years ago moved to Richmond. He served in the Sudan campaign of 1885, receiving the Egyptian medal and the Khedive's bronze star; in the Chitral campaign on the North-West Frontier of India, relief of Chitral, Frontier medal with a clasp. In 1914 he rejoined for service in the war of 1914–18, when he served first on a hospital ship, afterwards in Egypt, being absent from his practice for about five years. He received the O.B.E. on January 31, 1920. He leaves a widow and several children. Many friends of his own Service will lament the passing of a first-rate officer and doctor and a kindly and genial friend, though most of his friends and contemporaries are already gone, *multis ille bonis flebilis occidit*. He had been a member of the British Medical Association for thirty-three years.

Major JOHN ALFRED WYLDE EBDEN, Indian Medical Service, died at Delhi on November 10, aged 48. He was born on

February 20, 1891, and educated at Westminster and London Hospitals, where he gained an entrance scholarship and the Abrahams prize in clinical pathology. He qualified as L.M.S.S.A. in 1914, and graduated as M.B. and B.S.Lond. in 1916, also later as M.S. in 1921, and as M.D. in tropical medicine in 1926. He also took the F.R.C.S. in 1921, and the D.T.M. with distinction of the London School of Tropical Medicine in 1926. After serving as house-surgeon of the Leicester Royal Infirmary, he entered the R.A.M.C. as lieutenant and temporary captain on March 1, 1917, became captain on March 19, 1918, and resigned on July 1, 1919; rejoined as captain on August 19, 1921, and resigned with a gratuity on August 5, 1925. From 1926 to 1929 he served in the Colonial Medical Service in Malaya. He was appointed to the I.M.S. on December 6, 1929, being ranked as captain from January 20, 1924, and became major on July 20, 1932. At the time of his death he was serving as chief medical officer of Delhi. He served in the war of 1914–18. He had been a member of the British Medical Association for eighteen years.

Lieutenant ARNOLD NORMAN FLETCHER CRITCHLEY, R.A.M.C., Supplementary Reserve, was killed recently in a motor accident in France. He was educated at St. George's, and took the M.R.C.S.Eng. and L.R.C.P.Lond. in 1934. After filling the post of resident medical officer of the County Hospital at Dartford he went into practice at that town, where he was honorary medical officer to the Livingstone Hospital. He joined the R.A.M.C. Supplementary Reserve on April 5, 1939, and was a member of the British Medical Association.

Obituary

ANTON VON EISELSBERG

Hofrat Professor Anton von Eiselsberg, the famous Viennese surgeon, died on October 25. At the time of his death he was one of the eight surviving Foreign Corresponding Members of the British Medical Association. He was born on July 31, 1860, at Steinhaus, in Upper Austria, and studied at the Universities of Vienna, Würzburg, Zurich, and Paris, returning in 1884 to Vienna to work under Billroth. After holding surgical posts at Utrecht and Königsberg he became in 1901 chief of the first surgical clinic of Vienna, and was made emeritus professor in 1931. Apart from many important writings between 1890 and 1913, he was responsible for the *Lehrbuch der Chirurgie A. v. Eiselsberg*, published in Berlin. We have received from Dr. John Burke of Buffalo, N.Y., the following appreciation:

His fame was truly international, and there are hardly any civilized lands which have not paid him formal honours. With him an era of surgery becomes history and the Billroth school loses its last active member. It was as an assistant of Billroth's that he visited Lister, to return an enthusiastic advocate of antisepsis.

Even above von Eiselsberg the surgeon stands von Eiselsberg the man. To his patients and associates he will always remain an outstanding example of the nobleman in the truest sense of the word. In his clinic, in contrast to certain other Continental clinics, the physical and spiritual welfare of the patient came before all else, and the assistant or "Operateur" who neglected either was quickly informed of the error of his ways. The Hofrat's own conduct towards patients was a magnificent example. In passing it might be said that one of his more recent papers, "Arbeitsleistung und Arbeitseinteilung einer chirurgischen Universitätsklinik," is one of the finest expositions of the philosophy of the surgeon to be found.

To me the opportunity of working under him as an "Operationszögling" in the I. Chirurgischen Klinik in Vienna will be a happy memory. I think that I may speak for those of my fellow Americans who were privileged to know Anton von Eiselsberg when I say that an outstanding surgeon and a magnificent gentleman has gone to his reward.

By the death of Mr. THOMAS FRASER TODD in France on December 2 as the result of a motor accident Manchester has lost one of the most brilliant of its younger gynaecologists. Todd was a student of Guy's Hospital and qualified in 1931 with the M.B., B.S. and the M.R.C.S., L.R.C.P. He took his F.R.C.S. in 1933, the M.C.O.G. in 1934, and the London M.S. degree in the following year. He acted as house-surgeon and later as a demonstrator in anatomy at Guy's before being appointed resident surgical officer at the Preston Royal Infirmary. His work as a research fellow at the Christie Hospital and Holt Radium Institute in Manchester attracted attention, as did several papers on the treatment of carcinoma of the cervix uteri. He became honorary assistant gynaecologist to the Salford Royal Hospital and was also on the consultant staff of Hope Hospital, Salford, and of Crumpsall Hospital, Manchester. For his work on cancer of the cervix he was awarded a Hunterian professorship by the Royal College of Surgeons in 1938, and he was only recently appointed registrar to St. Mary's Hospitals, Manchester. He was one of the examiners in gynaecology for the General Nursing Council and an active member of the North of England Obstetrical and Gynaecological Society and of the Manchester Medico-Legal Society. Todd volunteered for active service at the outbreak of war and at the time of his death was a major attached to one of the B.E.F. general hospitals in France. His striking figure—he was tall, dark, and always immaculate—and the tremendous energy he brought to bear upon any and every problem soon made him well known. His untimely death at the age of 31 will be deeply regretted by many colleagues and friends in Manchester.

We regret to announce the death on December 3 of Dr. JOHN HARDWICK THORNLEY, consulting surgeon to the Scarborough Hospital, aged 62. A son of Canon Thornley, he was born at Workington, Cumberland, on August 28, 1877, and after schooldays at Cheltenham College entered Edinburgh University as a medical student in 1896. Having graduated M.B., Ch.B. in 1900, he served in turn as house-surgeon to the Edinburgh Royal Infirmary and extra assistant physician to the Royal Edinburgh Asylum, Morningside. He began his long connexion with the Scarborough Hospital as house-surgeon in 1901 and became honorary assistant surgeon in 1909. On retirement from the visiting staff he was elected consulting surgeon and a member of the Board in 1937. During the last war he served over-seas with the rank of major R.A.M.C., and won the Military Cross. Dr. Thornley had been a member of the British Medical Association throughout his professional life. He was chairman of the Scarborough Division in 1922–3 and president of the Yorkshire Branch in the following year.

We regret to announce the death of Dr. H. STEWART BRANDER on December 7 at Keighley, Yorkshire, where he had practised for many years and gained a high reputation as a surgeon. Born in 1880, he entered the University of Aberdeen, graduating M.A. in 1899, M.B., Ch.B. in 1903, and M.D. with commendation in 1906. He first went to Keighley after holding a resident appointment at James Murray's Royal Asylum, Perth, and for more than thirty years gave valuable service to the Keighley and District Victoria Hospital, becoming senior honorary surgeon in 1929. He was chairman of the medical committee, and represented the hospital on the Yorkshire Regional Committee of the British Hospitals Association. Dr. Brander was a founder member of the surgical union which was inaugurated by Lord Moynihan. He joined the British Medical Association in 1911, and had been president of the Keighley and District Medical Society. He represented the town on the Bradford Regional Radium Institute, and during the last war served with the rank of major R.A.M.C. as registrar and surgeon on the staff of the Keighley War Hospital at Morton Banks. After the armistice he was surgeon in charge of the Ministry of Pensions special surgical clinic. He published several papers on surgical subjects in the *British Medical Journal*.

Universities and Colleges

UNIVERSITY OF CAMBRIDGE

At a Congregation on December 10 the following medical degrees were conferred:

M.D.—T. G. Armstrong.

M.B., B.CHIR.—J. R. Squire, J. W. Lacey.

UNIVERSITY OF LONDON

The following candidates have been approved at the examinations indicated:

THIRD M.B., B.S.—*Revised Regulations:* *‡F. L. Dyson, *‡Lilias M. P. Gairdner, *†J. E. Richardson, *†P. T. Savage, *†Muriel C. Yates, J. C. Ballantyne, Rosalind S. Barclay, Anna M. Berry, G. Beven, Winifred C. M. Bulkeley, A. G. N. Calder, J. Colover, Jean M. Drury-White, P. McA. Elder, G. R. Fisk, J. M. French, F. J. Gillingham, J. F. Hughes, J. P. Irwin, G. C. A. Jackson, R. R. Klein, D. C. Lewin, H. F. Lunn, A. S. Oscier, J. Ll. Penistan, R. W. B. Scutt, Margaret M. Shrubsall, Joyce R. Simmons, S. C. F. Stephenson, M. Ware, Marguerite Watts, Alice Yates. *Old Regulations:* R. Asquith, J. R. Audy, I. H. Baum, R. C. S. Benson, K. M. Bhansali, J. Bleakley, A. D. Bone, J. A. Bowen-Jones, A. R. Bradley, J. R. Caldwell, D. M. F. Carter, C. D. Chilton, J. D. Craig, A. H. Cutting, H. H. Dickson, A. J. Drew, D. A. J. Ebrill, G. R. Fearnley, W. Fine, Betty Fox, H. R. W. Franklin, J. B. Franklin, F. N. Glover, A. C. Greene, W. E. Greenwood, E. R. Gubbay, Violet E. N. Harris, W. R. L. Harrison, C. F. Hawkins, S. R. T. Headley, F. A. Henley, R. N. Herson, R. N. Houlding, P. H. Jayes, J. B. Kershaw, B. Levin, W. S. Lewin, A. E. Loden, I. D. MacDonald, G. C. Mackay, A. H. Millard, H. E. Moody, A. D. Newsholme, D. A. Osborne, F. R. Philps, M. J. Pleydell, B. A. Pomryn, T. M. Ll. Price, H. V. Reeves, Constance M. B. Shaw, H. D. Smith, P. R. Stringer, F. D. G. Thomas, Joan Wagstaff, R. A. White, R. M. Williams, N. N. Wilson. *Group I:* H. A. C. Chalmers, P. W. Clarkson, J. R. Elwell, M. R. Hayes, Kathleen Hodkinson, E. G. Hosking, D. R. M. Jones, A. H. Mayne, R. P. M. Miles, I. H. Miller, J. Newsome, S. D. Perchard, F. H. Scoones, C. J. P. Seccombe, A. S. Sen, A. G. Stephenson, R. D. Ward. *Group II:* O. P. Dinnick, M. M. Ernst, S. T. Hayes, M. H. Kinmonth. *Revised Regulations—Part I:* G. C. Acres, T. A. H. Adkins, A. F. Baldwyn, D. A. Barley, W. R. Barrington, C. J. Bintcliffe, Monica M. Bird, Winifred M. Bond, Frances D. Bosanquet, G. R. Boyes, Barbara J. H. Broadwood, P. M. Burton, Joan M. Cheale, D. R. Christie, F. B. Cockett, D. P. Cocks, O. L. C. Cookson, Dorothy J. Cooper, H. P. F. Corbin, T. H. Cullen, W. Darby, E. R. Davies, J. I. Davies, L. D. de Launay, F. A. Denz, Evelyn M. Eldrid, M. Elias, G. R. Evans, I. G. Fergusson, Joan FitzHerbert, J. Freeman, H. J. Friend, K. Froome, A. D. M. Greenfield, Margaret E. Harker, J. T. Harold, J. R. Hart, D. H. Hennessy, S. W. Hinds, C. A. Holman, L. B. Holt, J. C. Houston, R. E. B. Hudson, W. H. W. Jayne, Anis Jones, Joyce A. Keeping, A. W. Kennett, H. H. Khan, W. S. Killpack, Irene M. V. King, D. R. Livingston, C. D. L. Lycett, Kathleen B. McClintock, D. G. C. Macdonald, M. McFarlane, Jean D. McKendrick, A. Maconochie, E. T. Manley, J. Marks, L. W. C. Massey, R. M. Mayon-White, F. B. Meade, Edith S. M. Merry, J. J. Messent, Margaret Middleton, J. V. Mitchell, R. Moore, B. L. Morgan, J. T. Morgan, Margaret E. Morgans, Sheila M. Newstead, Doreen Nightingale, D. Dixon, A. O. A. Ohannessian, B. C. H. O'Neill, J. W. Paulley, H. T. Phillips, P. D. Rawlence, K. O. Rawlings, H. H. Renyard, T. H. E. Richards, Joan A. Rosmarin, M. H. Rotman, R. W. Rowan, H. A. Rowley, A. F. Rushforth, A. Sakula, A. C. J. Saudek, J. N. R. Scatliff, E. Schlesinger, L. G. Scott, M. A. Shellim, Barbara M. Sibbald, Lesley P. Sitwell, Daisy M. Smith, Irene J. Stark, B. A. D. Stocker, P. H. Sutton, D. R. Syred, Margaret L. Taylor, H. A. Warbrick-Smith, J. A. E. Watts, M. Waytzman, A. Webb-Jones, R. Wigglesworth, D. W. Williams, D. A. J. Williamson, W. Wohlfarth, P. H. Woodcock. *Part II:* R. H. Anthony, Margaret Bennett, C. J. Bintcliffe, Jean R. C. Burton-Brown, Isabella S. Chalmers, I. R. Davies, Jean L. Edwards, Enid J. Fair, R. V. Jones, B. U. Meyer, E. W. Miles, D. A. Miln, Margaretta D. Morrell, A. S. S. Playfair, J. D. Randall, G. F. Smart, B. J. D. Smith, B. E. C. Stanley, May D. Westerman, Elizabeth Whatley, H. Wormald. *Part III:* Eileen M. Benison, F. Luckett, D. Munro-Ashman.

POSTGRADUATE DIPLOMA IN PSYCHOLOGICAL MEDICINE.—*With Special Knowledge of Mental Diseases:* D. W. Abse, Sophie Bookhalter, H. S. Joseph, W. A. O'Connor, J. D. Sutherland, J. D. Uytman. *Part A:* C. Phillips.

* With honours. † Distinguished in pathology.
‡ Distinguished in medicine.

UNIVERSITY OF DUBLIN

SCHOOL OF PHYSIC, TRINITY COLLEGE

The following candidates have been approved at the examinations indicated:

M.D.—A. H. Smith. D. H. T. Duggan.

FINAL MEDICAL EXAMINATION.—*Part I, Materia Medica and Therapeutics, and Pathology and Bacteriology:* †S. T. McCollum, †H. Lesselbaum, †Gladys M. Byers, †Lourenza C. Steytler, †L. H. Citron, A. H. H. Guilbride, T. A. H. Black, W. Badner, Florella Starritt, Emmeline P. Crowe, B. Marcus, C. R. Griffin, M. E. Weiner, D. O. Hicks, L. H. Shrago, M. J. M. Solomons, Dorothy H. Webster, P. C. Smyly, N. J. Anderson, Kathleen M. Patterson, A. C. McReynolds, S. Smullen, N. H. Stewart, M. G. Jackson-Smyth, S. D. Killen, A. G. Barnsley, J. P. Walsh, J. G. P. Mullally. *Part II, M.B.:* *P. M. Goedvolk, *H. H. Balch, †J. McD. Dougan, †E. G. Millar, †G. O. Atkinson, †Maureen C. Johnston, †H. D. Chomse, J. H. Tyrrell, P. H. Rubenstein, K. T. Acton, M. N. O'Riordan, S. Tennenbaum, M. H. Waters, Annie Dowds, J. L. Handelman, S. F. H. Haughton, J. H. Acton, P. C. Denham, W. M. Winn, M. Polansky, J. Morris. *B.Ch.:* †Muriel Bannister, †R. G. P. Heard, †J. C. G. Moore, †C. W. Bradfield, †D. Selman, †E. G. Millar, W. E. Bamford, B. S. Good, J. McD. Dougan, S. Fine, Kathleen Dowling, J. H. Tyrrell, G. F. N. Anderson, H. J. Draffin, Moira M. Mallagh, G. A. Anderson, N. J. Hogan, R. W. Carey, Sheila Kenny, Lucia M. E. FitzGerald, E. F. Keating, P. FitzG. Longford, P. C. Denham, T. N. Arthur, D. A. Huggard, W. Jones, R. Brass, A. H. Isaacson, R. F. G. Lyons, G. E. P. Kelly, D. St.B. F. Nunan, M. Shreider, R. R. Hogg, G. O. Atkinson, L. N. Lynch, I. Shreider. *B.A.O.:* *H. FitzGibbon, †Caroline A. McEvett, †Margaret Sutcliffe, †E. Kawerau, R. J. S. Wilson, P. FitzG. Longford, Frances M. C. Wolfe, H. Menter, J. H. Acton, D. Aiken, W. F. Rogers, Isabel M. Woodhouse, Lois J. Macaulay, J. I. Stafford, G. H. Blennerhassett, D. R. McCaully, S. D. Reid, P. H. Rubenstein, J. G. P. Mullally, D. O. Hicks, H. F. Kamp, N. Marks, Margaret L. Campbell, H. Hutchinson, H. J. Smith.

DIPLOMA IN GYNAECOLOGY AND OBSTETRICS.—M. M. Abou Ragab.

DIPLOMA IN PUBLIC HEALTH.—*Part II:* T. S. Agnew.

* First-class honours. † Second-class honours.

Medical Notes in Parliament

Before adjourning for the Christmas recess Parliament completed consideration of the Expiring Laws Continuance Bill. The House of Commons had a secret sitting to discuss the organization of supplies. It also heard a statement about the operations of the Royal Air Force, and discussed allowances to the unemployed and also old age pensions.

The Parliamentary Medical Committee met on December 12, Sir Francis Fremantle in the chair, and again considered the prevalent propaganda against vaccination and inoculation. The committee decided to inquire about the effect of this propaganda in the Forces. Discussion arose on the treatment of psychoneuroses in the field. It was decided to inquire whether the recommendations which had been made by a War Office committee of 1922 on shell-shock cases were receiving effect. A circular issued by the Medical Practitioners' Union on treatment of air raid casualties in hospitals rather than in first-aid posts was before the committee. The committee was informed that in the arrangements in the United Kingdom full use was made of the experience gained in Barcelona during air attacks.

State Control in Medicine

In the debate on the address in the House of Commons on December 5 Dr. EDITH SUMMERSKILL, after urging the Ministry of Health to plan after the war a medical service which would entirely eliminate private profit from the treatment of disease, and to institute a State medical service, said that during the last three months those who were in contact with medical services had seen a tremendous change. Harley Street and its district were practically emptied. Not only the physicians and surgeons but the patients had gone as well, and perhaps for the first time in their lives the best-paid and wealthiest physicians and surgeons—in their profession they regarded that as meaning the most successful—were being paid by Whitehall. A revolution had also taken place in the hospital service. The medical services had not functioned smoothly, partly because there had not been, fortunately, the anticipated casualties in the first weeks of war. In the hospitals there were surgeons who said that their fingers were getting rusty because they were not able to operate; in some places the hospitals were getting over-staffed. One tragedy which was not fully realized was that of doctors in evacuation

areas whose practices had disappeared with the war and who were sadly in need of some kind of relief.

If a very careful examination of the position were made, she believed it would be found that, in spite of these difficulties, for the first time in the medical history of the country we had in being the framework of a State medical service. For the first time in this country there was unified control and State remuneration for doctors. Young doctors in hospitals throughout the country were being paid an adequate salary instead of the £100 or £150 which they would get as house officers. If the State had decided that this was the only way to treat civilian casualties in war time, why not perfect the system and treat civilians in the same way in peace time? She challenged anyone to look at the latest municipal hospitals equipped with the latest scientific apparatus and then to look at the voluntary hospitals struggling along. It was absurd to tolerate the out-patient system. Outside the hospitals the dependants of the workers had no medical service at all, unless they could pay for it, and the middle classes were given what was often an inferior service.

Sir FRANCIS FREMANTLE said that the idea of a national medical service was not new. Dr. Summerskill did not seem to realize that the Poor Law was the first time the idea of a public medical service was brought into existence. It was necessary to link up the medical services, whether personal or institutional, more than was the case at present. We had been working in that direction with effect, but had not yet got to a completed scheme. One way was through the medical officers of health scheme, another was through the insurance scheme, unfortunately introduced as a separate organization. Voluntary hospitals were working together much more in the way of a public utility service. A Government which tried to socialize the medical profession, whether that was right or wrong in theory, would be very sorry. It would undertake an impossible proposition. What could and must be done was to help build up the present scheme, to help it forward in the direction in which it was going now, and guide its development. Dr. Summerskill's suggestion was that under a State system the doctors would be delighted to have a definite income, definite hours of work, and definite holidays. If that were so, then God help the patients, because doctors, like other people, were human. There were good, bad, and indifferent doctors. There were those who would say that they had done their eight hours' work, that their week-end or holiday was due, and that they would make their arrangements and go. If the doctors were under State control they would, as was the case with officials in any walk of life, insist on their rights, duties, and privileges, and would feel that it was the duty of the authorities to provide for the rest. The life-and-death questions of medicine could not be dealt with in that way. That was why they must continue the voluntary arrangements and voluntary control. It would be against human nature and against the facts of the case to socialize the whole of the profession and its institutions.

Dr. ELLIOT said that Lord Nuffield's gift of 1,000,000 ordinary shares in Morris Motors, Ltd., for the co-ordination of hospital finances and policy in the provinces was a great piece of planning. Even in the midst of war they were still able to obtain these princely donations for the purposes which they all desired—namely, to organize the proper relationship of the voluntary hospital to the municipal hospital and the co-ordination of the hospital system as a whole. It would be quite unfair for him, having asked for the collaboration of all sections of the community in the Emergency Medical Service, to impose on the profession some system with which it was not wholly in agreement.

Nutrition in War Time

The debate on the address continued on December 6. Miss ELLEN WILKINSON said the Government should have an intelligent food policy, particularly for the children and the unemployed. In the last war the nation was only beginning its knowledge on protective foods and vitamins. The influenza epidemic at the end of the war followed malnutrition in certain areas and a general lack of protective foods in the last years of the war, which reduced the resistance of the poorer parts of the population. Before the nation got near that position the Government should ensure to the children, to the lower-paid workers, and to the unemployed sufficient supplies of protective foods. It was possible to submit ordinary grade margarine to a process which produced ergosterol and to have vitaminized margarine. The sale of margarine not so treated should be made illegal to protect the lower-paid workers. Children were suffering now in towns where the schools were closed and the milk service temporarily stopped.

Sir GEORGE SCHUSTER remarked that although fats were important to the life of the nation, soap was still made with the full peace-time percentage of fat. Germany had come down to a soap which contained practically no fats at all.

Dr. HADEN GUEST protested against any deterioration in soap. The epidemics in the last war arose not only from bad nutrition but from dirt and filth in large parts of Europe. He criticized the calling of young men to the colours by age groups. Further use should be made of older men, and the Government should consider jumping a period of years and taking a class of older men. He was concerned at the prospect of, say, ten continuous age groups being subjected to war strain and many killed. Could they not build on the experience of past years a scientific review of the military and civilian use of man-power with a view to the human future?

Mr. EDEN said anyone who knew the average battalion of the new armies in the last war and compared the physique of the men then with the physique of the average Territorial battalion to-day must be impressed by the change. For the organization of our human resources the nation had the Department of Scientific and Industrial Research and the Medical Research Council, but despite their help the war would set new problems and further research and co-ordination would be necessary. He could assure Miss Wilkinson that Dr. Elliot and Mr. Colville were in communication with Sir John Orr and other leading authorities to see how good results could be ensured in nutrition during the war. The Government recognized the immense importance of the subject.

Ambulance Trains

Sir ALFRED KNOX inquired on December 7 whether Dr. Elliot knew that thirty-two trains, each with eight officials of the St. John Ambulance Association, at present stood idle. He also asked what the weekly cost of these officials was, and why the train and the personnel could not be assembled quickly in case of an emergency. Dr. ELLIOT answered that the casualty evacuation trains, which, owing to the course the war had taken, had happily not been used to a great extent, hitherto numbered twenty-eight, apart from two in Scotland. They were now being reduced to eighteen. The weekly cost of the orderlies averaged about £26 per train. The mobility of the trains and the need for keeping them and their equipment in constant readiness for immediate service, if required, made it necessary to keep trains and staff continually in commission.

Treatment of Contagious Diseases in Military Areas.—On December 5 Captain ELLISTON asked the Minister of Health whether extended arrangements were being made for the treatment of contagious diseases occurring in the civil population in the neighbourhood of military encampments and munition works. Dr. ELLIOT said that the position was under review, and he proposed shortly to issue a circular to the responsible local authorities on the matter.

Medical Boards: Classification of Examinees.—On December 7 Mr. RHYS DAVIES asked whether doctors who conducted examinations under the Military Service Act were familiar with the training given in the Forces to the men they examined. He asked Mr. Ernest Brown to invite all members of medical boards to witness such training so that they might relate their examinations to what was expected of the men later. Mr. BROWN replied that the classification of men examined by medical boards in the categories specified in the National Service (Armed Forces) (Miscellaneous) Regulations, 1939, was based on medical grounds. It was for the military authorities to determine the kind of service for which men so classified were suitable and to post them accordingly. He thought it unnecessary to adopt the suggestion made by Mr. Davies.

Hospital Visiting Hours.—Mr. DAVID ADAMS said on December 7 that certain municipal and voluntary hospitals had instituted alterations in their visiting days and hours, whereby for greater safety in case of air raids the number of visitors would be substantially reduced. He asked Dr. Elliot whether he proposed to recommend similar action throughout the country. Dr. ELLIOT replied that this was not a matter upon which he had specific information or upon which he would feel it desirable to make a general recommendation to the exclusion of the discretion of the authorities concerned.

Dental Treatment for Evacuated Persons.—Dr. ELLIOT said on December 7 that dental treatment fell within the scope of the health services which local authorities in receiving areas had been urged to extend to members of the evacuated priority classes. In addition, the Board of Education had asked local education authorities in a recent circular to make special arrangements, where necessary, for emergency dental treatment, including extraction, for school children.

Notes in Brief

On December 5 Mr. HORE-BELISHA informed Sir Irving Albery that adequate arrangements had been made to provide a physiotherapy department in military hospitals and in convalescent homes for wounded.

One Act covered by the Postponement of Enactments (Miscellaneous Provisions) Bill is the House-to-house Collections Act, 1939.

Medical News

Sir Walter Langdon-Brown has been appointed President of the British Social Hygiene Council in succession to the Right Hon. L. S. Amery, M.P.

The House of the British Medical Association, including the Library, will be closed for the Christmas holiday from 5 p.m. on Friday, December 22, to 9 a.m. on Wednesday, December 27.

We are asked to announce that a child guidance clinic, providing a limited service, is available at Guy's Hospital (London Bridge, S.E.) for the hospital's area.

Plans have been made for the third Pan-Arabian Congress and the twelfth Annual Congress of the Egyptian Medical Association to be held simultaneously at Jedda from January 16 to 21 during the period of the Mussulman pilgrimage. The fee is one Egyptian pound. Further information can be obtained from Professor M. Khabet Bey, Kasr El-Ani Post Office, Cairo.

The Pan-American Congress of Rural Hygiene organized by the Government of Mexico has been postponed indefinitely; also the International Congress of Oto-rhino-laryngology, which was to have been held in Amsterdam next year.

The Hospital of the Rockefeller Institute for Medical Research, New York, announces that the following diseases are under investigation for the years 1939–40: nephritis, heart disease, rheumatic fever, measles, and acute respiratory diseases. Suitable patients may be referred to the hospital by physicians and others willing to co-operate. No charges are made for treatment, board, room, or any other services.

The Lord Mayor of London presided over the annual meeting of the Royal Surgical Aid Society on December 4. He said that 27,378 patients were dealt with last year and 36,561 appliances were supplied. The work deserved sympathy, for it not only prevented much suffering but enabled those relieved to become self-supporting. The Dean of Manchester (the Very Rev. Garfield Williams, M.B.) said that he could imagine no more discriminating charity than this, and Lord Justice Du Parcq also spoke in its support. Mr. B. Whitchurch Howell acknowledged a vote of thanks to the surgeons of the society.

The State Department of Health for Illinois announces in the *Journal of the American Medical Association* that during the current pneumonic season both serum and sulphapyridine will be distributed free to doctors.

The issue of *Le Bulletin Médical* for November 4, which is devoted to neuropsychiatry, contains the proceedings of the International Congress of Neurology held at Copenhagen from August 21 to 26, 1939.

The Drugs Branch of the Home Office has moved to Cleland House, Page Street, Westminster, S.W.1.

Dr. Alexis Carrel has joined the staff of the French Ministry of Public Health for the duration of the war.

According to the statistical office of the Reich, Germany had 4,745 hospitals with 630,000 beds in 1937.

EPIDEMIOLOGICAL NOTES

Infectious Diseases for the Week

In England and Wales an increase was recorded in the incidence of the commoner notifiable diseases, with the single exception of pneumonia (primary and influenzal), but the diseases for which comparable figures are available were less prevalent than in the corresponding week last year. Certain less common but serious notifiable diseases—for example, cerebrospinal fever, the enteric fevers, and acute poliomyelitis—all showed slight decreases compared with last week, and, cerebrospinal fever excepted, with the corresponding week last year. In London notifications of diphtheria were considerably higher, of scarlet fever unchanged, and of measles and whooping-cough somewhat fewer. As mentioned in these columns previously, the very low incidence in London of diphtheria and scarlet fever compared with previous years can only be attributed to the effects of the evacuation of a large proportion of non-immunes, but it is not justifiable to conclude that the somewhat lower incidence of these diseases in England and Wales as a whole is due to the abnormal distribution of these individuals, although this may well prove to be the case. The effect of evacuation on the London figures is even more strikingly exemplified by the notifications of dysentery; although the disease is almost as prevalent in the whole country as it was last year, no case was notified in London during the present week and only one in the previous week. Dysentery was more prevalent, absolutely as well as relatively, in Scotland than in England and Wales a few weeks ago, due in large part to the occurrence of an epidemic in Edinburgh. Of the 28 cases recorded in Scotland during the week, 11 were in this city; in the previous week the figures were 39 and 16 respectively. The disease was mild and appears to have had no effect on the mortality from enteritis and diarrhoeal diseases in children under 2 years.

Notifications of whooping-cough were slightly and of measles much in excess of those recorded in the previous week. At present whooping-cough is fairly evenly distributed among urban and rural areas in England and Wales; only seven administrative counties are free from it—namely, Cambridge, Isle of Ely, Isle of Wight, Hunts, Rutland, Westmorland, and Anglesey (Wales), compared with ten counties free from measles—namely, Berks, City of York, Hereford, Isle of Wight, Norfolk, Rutland, Suffolk West, and the Welsh counties of Cardigan, Montgomery, and Radnor. Considerable differences were encountered in the comparative incidence of whooping-cough and measles; in London 32 against 6 and in Birmingham 40 against 4 respectively, while in Liverpool and Manchester measles were low and the differences slight. The bulk of the measles cases in each county occurred in the urban centres: Cumberland 183 (Workington M.B. 84); Devon 137 (Okehampton M.B. 42); Lancaster 185 (Blackpool C.B. 41, Great Harwood M.B. 35, Lancaster M.B. 23); Salop 103 (Newport 43, Whitchurch 20); Warwick 102 (Leamington M.B. 46). Anomalous findings are not infrequent. Thus, in Berks there were 24 cases of whooping-cough and none of measles, and in the adjacent county of Bucks there were 79 cases of measles and only 5 of whooping-cough; in the West Riding of Yorks there were 82 cases of whooping-cough against 59 of measles, and in the East Riding the corresponding figures were 69 and 6 respectively.

No. 47

INFECTIOUS DISEASES AND VITAL STATISTICS

We print below a summary of Infectious Diseases and Vital Statistics in the British Isles during the week ended November 25, 1939.

Figures of Principal Notifiable Diseases for the week and those for the corresponding week last year, for : (a) England and Wales (London included). (b) London (administrative county). (c) Scotland. (d) Eire. (e) Northern Ireland.

Figures of Births and Deaths, and of Deaths recorded under each infectious disease, are for : (a) The 126 great towns in England and Wales (including London). (b) London (administrative county). (c) The 16 principal towns in Scotland. (d) The 13 principal towns in Eire. (e) The 10 principal towns in Northern Ireland.

A dash — denotes no cases ; a blank space denotes disease not notifiable or no return available.

Disease	1939					1938 (Corresponding Week)				
	(a)	(b)	(c)	(d)	(e)	(a)	(b)	(c)	(d)	(e)
Cerebrospinal fever	27	2	6	3	2	19	6	11	2	—
Deaths		—	2				1	1		
Diphtheria	1,074	38	229	61	42	1,535	181	272	54	30
Deaths	27	—	11	4	2	31	4	6	5	—
Dysentery	70	—	28	—	—	73	7	31	—	—
Deaths			1	—	—			—	—	—
Encephalitis lethargica, acute	1	—	1	—	—	3	—	—	—	—
Deaths		1	—				2	1		
Enteric (typhoid and paratyphoid) fever	19	1	1	6	1	21	9	1	10	1
Deaths	—	—	—	1	—	1	—	—	—	—
Erysipelas			77	5	8			79	4	4
Deaths		—	1				2	1		
Infective enteritis or diarrhoea under 2 years										
Deaths	24	3	14	4	1	37	11	8	6	1
Measles	2,011	6	12				21	14		
Deaths	—	—	—	1	2	3	—	—	—	—
Ophthalmia neonatorum	53	3	22		1	87	10	38		—
Deaths										
Pneumonia, influenzal*	485	26	13	1	16	659	71	7	1	13
Deaths (from influenza)	26	4	1	1	2	28	4	5	1	5
Pneumonia, primary			141	8				365	7	
Deaths		6		11	10		13		15	6
Polio-encephalitis, acute	3	—				3	3			
Deaths		—					—			
Poliomyelitis, acute	12	—	—	1	—	39	7	3	—	—
Deaths		—	—				—	—		
Puerperal fever	4	4	8	3	—	5	5	19	2	—
Deaths		—					1†			
Puerperal pyrexia	158	6	15		2	150	17	19		—
Deaths										
Relapsing fever	—	—			—	1	—			—
Deaths										
Scarlet fever	1,383	34	216	66	116	1,969	175	324	62	76
Deaths	3	—	—	—	—	1	—	2	1	—
Small-pox	—	—	—		—	3	—	—		—
Deaths		—	—	—	—		—	—	—	—
Typhus fever	—	—	—	—	—	—	—	—	—	—
Deaths			—	—	—			—	—	—
Whooping-cough	1,414	32	32		2		169	298		15
Deaths	2	—	—	—	—	7	1	5	—	—
Deaths (0-1 year)	269	25	59	23	15	291	59	68	26	18
Infant mortality rate (per 1,000 live births)						48	48			
Deaths (excluding stillbirths)	4,406	668	618	200	121	4,291	824	609	169	151
Annual death rate (per 1,000 persons living)			12.5	13.4	10.6	10.5	10.5	12.4	11.4	13.4
Live births	6,367	812	806	351	252	5,789	1,145	809	321	201
Annual rate per 1,000 persons living			16.3	23.6	22.1	14.2	14.6	16.5	21.7	17.8
Stillbirths	250	23	40			256	38			
Rate per 1,000 total births (including stillborn)			47			42	32			

* Includes primary form in figures for England and Wales, London (administrative county), and Northern Ireland.
† Death from puerperal sepsis.

Letters, Notes, and Answers

All communications in regard to editorial business should be addressed to THE EDITOR, BRITISH MEDICAL JOURNAL, B.M.A. HOUSE, TAVISTOCK SQUARE, W.C.1.

ORIGINAL ARTICLES and LETTERS forwarded for publication are understood to be offered to the *British Medical Journal* alone, unless the contrary be stated. Correspondents who wish notice to be taken of their communications should authenticate them with their names, not necessarily for publication.

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EDITOR OF THE *BRITISH MEDICAL JOURNAL, Aitiology Westcent, London.*
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The address of the B.M.A. Scottish Office is 7, Drumsheugh Gardens, Edinburgh (telegrams: *Associate, Edinburgh;* telephone 24361 Edinburgh), and of the Office of the Cumann Doctúirí na h-Éireann (I.M.A. and B.M.A.), 95, Merrion Square, W., Dublin (telephone 62550 Dublin).

QUERIES AND ANSWERS

Erythema of Eyelids

Dr. W. A. MUIR writes: A girl of 18 is subject to redness of eyelids, especially after spending a day out in the open. She has been subject to this for some years. General health is good. Ung. hyd. ox. flav. and optrex have been tried without much success. Can any reader make suggestions for treatment?

Chronic Muco-purulent Otorrhoea

Dr. F. C. COLLINSON (Rotherham) writes: I wonder if any of your readers could help me with suggestions in the treatment of a case of middle otorrhoea, thick muco-purulent discharge going on for more than a year, large perforation in each drum; the discharge is loaded with diphtheria bacilli of a non-virulent character. The patient is very fit now, though he had an artificial pneumothorax and was in a sanatorium for a long time. The ear condition is undoubtedly due to an attack of measles he had when a child. The treatment has been keeping the ears as dry as possible, douching with antiseptics, electric treatment, and diphtheria antitoxin. Up to now no improvement has taken place so far as discharge is concerned, and he is certainly somewhat more deaf.

Muscular Twitchings

Dr. E. J. BOWMER (Liverpool) writes in reply to "H." (November 25, p. 1072), who asked for suggested treatment to control general twitching of the muscles: I have had several cases of generalized twitching associated with tremors which appeared to be of the Parkinsonian type: unsteady gait, "pill-rolling" of fingers, irregular movements of arms, and twitching of the facial muscles. While there is little hope of arresting the progress of the disease in these senile cases, I have found that they respond well to administration of genoscopolamine granules, one to two t.d.s., p.c. The preparation is the amido-oxide of scopolamine prepared by Lab. Amido.

A Historic X-ray Apparatus

Dr. GEOFFREY A. HOFFMAN writes from Cranham, Gloucester: With reference to Dr. R. T. Gunther's inquiry under the above heading (November 25, p. 1072), I am doubtful of the correctness of Captain E. G. Spencer-Churchill's statement. On Professor Roentgen's discoveries of *x* rays in 1896 my uncle, the late Dr. J. Hall-Edwards of Birmingham, at once became keenly interested in the subject. In February of that year he produced the first radiograph taken outside London and the first radiograph of the spine. The first operation in this country as a direct outcome of the application of the rays was made from one of his negatives. I understand that Dr. Hall-Edwards equipped a portable apparatus for use in warfare, and, in addition, on the outbreak of the Boer War in South Africa he became attached to the Imperial Yeomanry Hospital as surgeon radiographer under the leadership of Sir Alfred Fripp. In an article written by himself he states that he dealt with 120 cases in the hospital at Deelfontein in the first five months alone, and gives an interesting account of it.

Income Tax

New Partnership—Old Debts

"PERU" refers to a reply in our issue of April 29 last, and inquires whether he has been right in acquiescing in the bringing into the firm's cash receipts of amounts paid on old accounts—that is, for services rendered before the present partnership came into being.

*** The reply quoted referred to different circumstances. In that case the former proprietor had retired, his professional earnings had ceased, and there was no question of his being assessable for subsequent years as a practitioner. In "Peru's" case he is still chargeable in respect of professional earnings. None the less he could have declined to have the old receipts brought into the new firm's accounts, but in that case the inspector of taxes would have rightly claimed that the cash receipts were not a fair index of the gross earnings of the practice, and would have insisted on the basis of bookings less an allowance for bad debts. Rather than become involved in the inconveniences of that method of computation most practitioners prefer to adhere to the cash receipts basis, even with the necessary corollary—that is, that *all* receipts be brought in, whatever their destination.

Honorary Appointment Expenses

"R. H." was, before the war, doing honorary work for a London hospital which entailed travelling once a week between London and the provincial town where he lives. Can he deduct the expenses so incurred?

*** If during the period in question "R. H." was in general practice we think that the Inland Revenue authorities would not object to the merging of the travelling expenses in those of the practice—as would certainly be done if "R. H." had been receiving a small fee for his services. But it is clear that he cannot deduct those expenses from other earnings—for example, from his pay, etc., as an officer in the R.A.M.C.

LETTERS, NOTES, ETC.

Treatment of Angina and Hyperpiesia

Dr. H. W. HALES (Bedfordshire), with reference to the leading article in our issue of November 4 (p. 915) on the drug treatment of angina and hyperpiesia, writes: I have had no small measure of success in both angina and hyperpiesia with a combination of colonic lavage with potassium permanganate and a diet reduced for some days to water and then to oranges and grapefruit only for some weeks. I do not know whether the results may be attributed to the potassium or the manganese ion, but it is certainly obtained when this salt is used for colonic lavage and not obtained when other salts are employed.

Calendars and Diaries

The high quality of the calendars and diaries produced by John Walker and Co., Ltd. (5 and 6, Warwick Lane, E.C.4) remains unchanged despite war-time conditions. The bindings of the samples sent to us display the same attractiveness as in former years, and the prices of the diaries range from 1s. upwards.

The Dental Mnaufacturing Company Ltd. (Brock House, 97, Great Portland Street, W.1) have issued their diary of appointments for 1940. It contains, as usual, space for half-hourly appointments, a week's appointments being visible at an opening, and much information of interest to dental practitioners. The detachable finger-indexed address book must be a great convenience to those using the diary; its price (plain edition) is 6s. 6d., postage 6d. extra.

Chocolates for Christmas

Samples of Messrs. Cadbury's well-known goods have been sent to us, and we are informed that in addition to making chocolate for the men and women in the Forces and for Civil Defence workers, chocolate boxes for Christmas presents will be available as usual. Prices of the gift boxes and caskets range from 6d. to 40s., and there are supplies of the varieties obtainable all the year round.

Corrigendum

Dr. W. NEWTON CHALMERS (Kirkcudbright) points out that the legend under Fig. 1 in the article by Mr. Philip Wiles on "Fractures of the Neck of the Femur" (*Journal*, November 4, p. 920) is incorrect. It should read, "Adduction fracture with upward displacement and *external* rotation"—not "*internal* rotation."